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November 1980

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GOLDEN GATE BRIDGE HIGHWAY AND TRANSPORTATION DISTRICT

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GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT

DRAFT ECONOMIC AND ENVIRONMENTAL
ANALYSIS OF
PROPOSED TOLL INCREASES

November 1980

PREFACE

The Golden Gate Bridge, Highway and Transportation District is a special district which operates and maintains the Golden Gate Bridge, and provides public transit service within Marin and Sonoma Counties and between San Francisco, Marin and Sonoma Counties and provides ridesharing services for commuters of San Francisco, Marin, Sonoma and Napa Counties. It provides these services under authority of California state law.

The District's funding is provided from the collection of tolls from persons using the Bridge and fares from patrons of the transit system. To the extent possible, these revenues are supplemented by capital and operating subsidies from Federal, State and local governments. The District does not levy a property, sales or other form of tax.

Background to this Report

In September 1977, the District's Board of Directors increased the basic automobile toll from \$0.75 to \$1.00 and increased bus and ferry fares, while initiating a discount of 20 percent from the basic cash fare for regular users of the transit system who purchased monthly commute ticket books.

In August 1978, after litigation challenging the September 1977 toll and fare increases, the Board of Directors reaffirmed the \$1.00 toll and the transit fare increases, but reduced the discount from 20 percent to 10 percent for commute ticket book holders.

In September 1979, the Board of Directors further increased bus and ferry fares (by approximately 20 percent) and reduced the hours during which carpools (automobiles with 3 or more occupants) were permitted to use the Bridge free.

There have been no major adjustments in tolls or transit fares since September 1979, other than the charges to Club Bus patrons (see section 2.1) which increased in August 1980.

The economic pressures which induced the Board of Directors to implement these increases in tolls and fares have not abated. In September 1980, the District staff presented an analysis of projected revenue and expenditures over the next five years to the Board. In outline, this analysis showed that were the District to maintain both the present level of transit services (i.e., its bus, ferry, club bus, and vanpool programs) and the current toll and fare structure, it would incur substantial, and increasing, annual deficits over each of those years. Available District reserves are not adequate to fund the deficit projected for this fiscal year. Moreover, without either an increase in revenues or a reduction in transit service, even the restricted District reserves (e.g., those committed for structural replacement of the Bridge deck, replacement of buses and payment of losses not covered by insurance would be consumed entirely by 1983 were they to be depleted to cover projected deficits over the next two fiscal

years.

In response, the Board directed that the staff prepare an analysis of several alternative toll structures designed to increase revenue and to consider as well fare increases as a means of generating additional revenue, either independently or in conjunction with toll increases. This report is the draft of that analysis. Public hearings on the alternative proposals have been scheduled for November, 1980.

Format of this Report

Each of the recent toll and/or fare increases described previously has been preceded by a staff report analyzing the economic, environmental, traffic and energy implications of a variety of alternative toll/fare adjustments. The reports prepared in 1977 and 1978 followed the format prescribed for Environmental Impact Reports under the California Environmental Quality Act. CEQA was amended in 1978 to exempt the actions of local agencies in increasing or otherwise modifying tolls, fares and other user charges from the requirements of that Act.

The toll and fare adjustments addressed in this draft report fall within the statutory exemption and the District need not prepare an EIR before adopting one, or a combination of, the alternatives now under consideration. However, the format of an EIR permits an orderly analysis of the impacts of contemplated actions and of alternatives to it. Thus, in the interests of ensuring that a range of possible alternatives is explored and opened to public discussion and of furthering public understanding of its financial and operating policies, the Board has elected to analyze the various options proposed within the format of an EIR, though not legally required to do so.

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1.0 SUMMARY

The public transit and ridesharing programs operated by the Golden Gate Bridge, Highway and Transportation District will incur a deficit of expenses over farebox revenue and federal and state subventions in excess of \$10 million during the current fiscal year (July 1, 1980 - June 30, 1981). Approximately \$7.5 million of this deficit will be covered by Bridge toll revenue not immediately required for the operation, maintenance, repair and reconstruction of the Bridge itself. Another \$2.5 million was available for support of transit from reserve funds on hand at the beginning of FY 1980/81 not pledged to purposes other than transit operation subsidy. However, the sum of bridge toll revenue and reserves will be approximately \$900,000 short of meeting the projected FY 1980/81 transit deficit. Moreover, in FY 1981/82, the transit-generated deficit is expected to exceed toll revenues available by slightly over \$4 million during that fiscal year.

An overview of the District's projected financial condition over the 1980/85 period is shown in Appendix A. Those projections assume no increase in Bridge toll or transit fare revenues and continued operation of the District's transit and ridesharing programs at essentially their current levels. As can be seen, the assumption is unrealistic since all available reserves would be depleted by the end of June 1981 and total District reserves by the latter part of 1983.

The alternatives facing the District are, in brief, to either increase its revenues or to decrease its expenditures. Given the magnitude of the deficits projected for FY 1981/82 the only method of reducing expenditures which could avoid the need for significant increases in revenue is a substantial cutback in transit service.

This report examines the economic and environmental effects of various proposals for increasing revenues through Bridge toll increases and/or transit fare increases. The impacts of service reductions of a magnitude necessary to eliminate the need for additional revenues are also described.

Section 2 of the report describes four alternative toll structures, each of which is expected to generate more revenue than the current \$1.00 toll. The four alternatives share one common characteristic; in each, the current automobile toll would remain unchanged except during the morning and evening commute peak periods and in each the toll during those periods would vary depending on the number of occupants in the vehicle.

Section 3 of the report describes the most relevant aspects of the "environmental setting" within which the impacts of the four differential toll options, as well as the other toll, transit fare, service reduction and financial policy alternatives, may be evaluated.

Section 4 analyzes the impacts on revenue, traffic congestion, energy use, and air quality of each of the four differential toll options described in Section 2. In general terms these differential tolls would increase District revenue (from between \$1.15 million to \$2.67 million in FY 1981/82) and would reduce the number of automobiles crossing the Bridge by 160,000 annually to 340,000 annually. The reduction in vehicle crossings (and the parallel reduction in energy consumption and air pollutant emissions) is inversely related to revenue generation. That is, Alternative B which has the most significant impact in terms of reducing traffic and fuel usage, also generates the greatest amount of additional revenue. Alternative A, which is expected to generate the least additional revenue, also has the least effect on traffic patterns and energy savings. Two of the alternative differential tolls (Alternatives B & D) would generate sufficient additional revenue to preclude the need for transit reductions during the present fiscal year and would nearly do as well. None, however, would in itself produce sufficient revenue to cover the projected deficit through FY 1981/82. For regular commuters, the maximum potential additional cost of Alternative A, on an annual basis, would be \$125; for each of the other differential toll options it would be \$250. The economic impact of this additional expense would be most severe on those commuters who have low incomes and who are unable to use public transit, share rides with others, or alter their driving time.

Section 5 of the report describes a number of alternatives to enacting a differential toll of the type analyzed in Sections 2 and 4. Among the major alternatives addressed are: (1) other forms of Bridge toll increases, all of which involve increases in tolls at both commute and non-commute times; (2) transit fare increases; (3) operating economies other than transit service reductions; (4) transit service reductions; (5) consumption of restricted reserves to subsidize transit.

With respect to alternate types of toll increases, five options are identified (Alternatives E-I), except Alternative G, all would produce more revenue than any of the four differential tolls. Alternative G would be expected to produce \$1.75 million in additional revenue during FY 1981/82, the projected range for the other 4 options is from \$3.42 million to \$8.3 million annually. The relationship of these alternatives to the four analyzed in Section 4 can be seen in Table 1-1.

A transit fare increase as an alternative is discussed, employing a fare structure sufficiently high that 60% of transit operating expenses are recovered from fares, as opposed to the 50% level established by current Board policy. As can be seen from Table 1-1, such an increase, in isolation, would generate approximately \$1.2 million in additional revenue during FY 1981/82, an amount lower than any toll alternative except Alternative A. In contrast to toll increase options, a fare increase of this magnitude would increase vehicle use over currently prevailing levels (by about 3.9 million

vehicle-miles during the year) and increase fuel consumption and pollutant emissions. The maximum economic impact would be on a transit dependent commuter from the northern end of the service area, whose annual commute cost could be expected to rise by approximately \$200 per year in FY 1981/82.

The feasibility of operating economies is discussed, the most promising possibility being the conversion of the gas turbine ferries to diesel power. If capital funding for this conversion can be obtained, fuel costs of ferry service could be reduced by up to \$894,000 per year, but this saving could not be realized until 1982 at the earliest.

Transit reductions of the order needed to avoid deficits at present toll and fare levels would have to be substantially--on the order of 27% during FY 1981/82. Greater cuts would be required thereafter. The impacts of reductions of this magnitude on traffic levels, fuel usage, commute times, and pollution would be markedly greater than those associated with transit fare increases of the levels analyzed.

Finally, the course of invading restricted reserves as a temporary source of transit funding is discussed and found to be inconsistent with District policies and goals.

SUMMARY OF IMPACTS OF ALTERNATIVE POLICIES IN FY 1981/82

Alternative	Annual Revenue of Cost Saving (thousands of dollars)	Bridge Traffic		Annual All Hours Both Directions (thousands of autos per yr.)	Emissions CO HC	Fuel Consumption (thousands of gallons per year)
		Daily Peak Period Southbound	7-9 am 4-6 pm (autos per day)			
A.	1,150	-261	- 61	-162	- 71 - 6 - 9	-172
B.	2,670	-548	-136	-345	-152 - 13 - 19	-366
C.	1,550	-492	- 96	-297	-131 - 11 - 16	-315
D.	2,130	-520	-116	-320	-141 - 12 - 18	-340
E.	4,170	-152	- 15	-131	- 59 - 5 - 8	-144
F.	8,280	-302	- 89	-290	-130 - 11 - 18	-319
G.	1,750	-288	- 78	-188	- 85 - 7 - 11	-208
H.	3,420	-288	- 78	-214	- 96 - 8 - 13	-236
I.	4,610	-274	- 68	-218	- 98 - 9 - 13	-240
60% Farebox Return on Inter-county Buses	1,230	+525		+182	+ 82 + 7 + 11	+201
60% Farebox Return from local Marin Patrons on Inter- county Buses					+ 17 + 1 + 2	+ 41
Service Reduction	4,600	N/A		+1,763	+793 + 69 + 108	+1,942

2.0 DESCRIPTION OF PROPOSED ACTION

The Golden Gate Bridge, Highway and Transportation District operates the Golden Gate Bridge as a toll bridge, operates ferry transit services between Marin County and San Francisco and operates bus transit services on routes within and between San Francisco and Marin and Sonoma Counties. Bus transit services within Marin County and Sonoma County are provided under agreements with the two counties in which the counties determine the level of fares. The level of bus transit fares for trips extending beyond either Marin or Sonoma Counties, the level of ferry transit fares, and bridge tolls are determined by the District.

2.1 LOCATION AND BOUNDARIES

The Golden Gate Bridge is a six-lane highway bridge spanning the Golden Gate Straits between Fort Point in San Francisco and Lime Point in Marin County. Toll gates are located at the southern approach to the Bridge. Opened as a toll facility in 1937, the Golden Gate Bridge provides the only direct land-based transportation connection between the San Francisco Peninsula and the north bay peninsula, comprised of Marin and Sonoma Counties. The location of the Golden Gate Bridge is shown in Figure 2-1. The relationship of the Bridge to the regional transportation network is described in Section 3.1.

The Golden Gate Ferry system provides service seven days a week between the San Francisco Ferry Terminal and the Ferry Landing in Sausalito using the 575 passenger MV Golden Gate, and between the San Francisco Ferry Terminal and the Larkspur Ferry Terminal using two 735-passenger gas turbine powered vessels.

Feeder bus services operated by Golden Gate Transit connect certain Marin County neighborhoods with either the Sausalito or Larkspur ferries, and also services connect with a privately-owned ferry in Tiburon. The bus and ferry schedules are coordinated.

Golden Gate Transit operates a fleet of 260 buses on a route network extending from the San Francisco Civic Center and Financial District in the south to Sebastopol and Santa Rosa in Sonoma County to the north. The transit service area and its relationship to local communities is shown in Figure 2-2. The central bus administration and maintenance facility is located in San Rafael, Marin County. Satellite facilities are located at Novato in Marin County and Santa Rosa in Sonoma County. The U.S. 101 freeway and its parallel service roads form the trunk

facility of the 550-mile Golden Gate Transit route network. The various routes branch from the freeway to serve local communities.

In addition to its transit services, the District provides a number of ridesharing programs for commuters. Through its Club Bus Program, 21 chartered private buses carry approximately 800 commuters between points not served by transit. The carpooling program provides referrals to a regional matching service and provides toll-free passage on the Golden Gate Bridge for carpools of 3 or more persons between 7 and 9 a.m., and between 4 and 6 p.m. on weekdays. The Vanpool Program which was initially financed by a federal demonstration grant uses a fleet of thirty-three 10- or 12-passenger vans to help newly formed vanpooling groups to begin organized commuting by vanpool. Once established, the groups acquire their own van. Introductions and organizational guidance are also provided. To date 174 vanpools have been formed.

A detailed description of the District's transit facilities and service is provided in the Five Year Transit Development Plan FY 1980/81 - 1984/85 (Ref. 3).

2.2 EXISTING TOLLS & FARES

2.2.1 BRIDGE TOLLS

Bridge tolls are paid by vehicles passing in the southbound direction only. Toll charges for all categories of vehicle are shown in Table 2-1. Private automobiles pay \$1.00, except that commute period carpools (with 3 or more occupants) pass toll free from 6-9AM and from 4-6PM weekdays.

2.2.2 FERRY FARES

The Larkspur Ferry Terminal is located in Fare Zone 3.

Adult fare, one-way between Larkspur and San Francisco, is \$1.50 on weekdays and \$2.00 on weekends and holidays. A discount fare of 75¢ on weekdays and \$1.00 on weekends and holidays is available to youths (aged 6-12), senior citizens (65 or older with Bay Region Transit Discount Card), and handicapped persons.

The Sausalito Ferry Terminal is located in Fare Zone 2.

Adult fare, one-way between Sausalito and San Francisco, is \$2.00 every day of the week. A discount fare of \$1.00 is available to youths (aged 6-12), senior citizens (65 or older with Bay Region Transit Discount Card), and handicapped persons.

If a handicapped person is authorized to be accompanied by an attendant, the attendant may travel for the same discount fare as the handicapped person. Children (aged 5 or less) travel free when accompanied by an adult (limit of two children per adult). Commuters can obtain a discount of 10% below the zone based cash fare on books of 20 tickets or purchase a 7-day ferry pass for \$10.00.

Feeder bus routes operate between the Larkspur Ferry Terminal and various parts of Marin County. A fare of 25¢ is charged for service from the Ferry Terminals.

2.2.3 BUS FARES

Bus Fares are determined by zones and vary according to length of trip and the number of zones traversed. Fare zones are shown on the System Map, Figure 2-3 and the zone to zone Fare Matrix is shown in Table 2-2.

2.3 OBJECTIVES OF THE PROPOSED ACTION

The principal objective of the proposed toll increase is to raise additional revenues to permit the District to continue to operate its public transportation services (bus and ferry systems, club bus, vanpool and carpool programs) while preserving adequate reserves for (1) future repair, modification or improvement of the Golden Gate Bridge (including approximately \$10 million as the local share of the \$50 million Bridge Rehabilitation Program scheduled for 1981-85);

(2) replacement of buses and ferries; (3) periodic dredging of the Larkspur Ferry Channel; (4) coverage of uninsured losses; and (5) unanticipated emergencies.

A related objective is to generate the necessary revenue in a manner which is (1) supportive of national, state and regional policies designed to conserve fuel and improve air quality; (2) consistent with regional transportation policies and the District's own traffic management and transit pricing policies; (3) equitable to users of the District's multiple transportation facilities.

2.4 CHARACTERISTICS OF THE PROPOSED ACTIONS

The District is considering several alternative toll increases, which would raise tolls for single occupant autos during the commuter peak periods, as well as more generally applicable toll increases, fare increases and the possibility of reducing transit services as an alternative to toll or fare increases.

The increase would be effective January 1, 1981, or as soon as possible thereafter. Four alternative toll structures have been identified by the Board of Directors for prime focus in this analysis. These alternatives are described in detail in this section. The remaining alternatives are considered in Chapter 5.

Each of the four prime focus alternatives would establish a "differential" toll structure for private automobiles during the peak periods - 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. on Mondays thru Fridays, except holidays. At other times, and at all times for vehicles other than private automobiles, the existing toll structure would be unchanged. The differential toll structure would involve a higher toll for single occupant autos, a lesser toll for autos with two occupants and free passage for car-pools with three or more occupants. The differential toll structures involved in each of the four prime focus alternatives (designated alternatives ABC and D) are shown in Table 2-3.

TABLE 2-1
EXISTING TOLL SCHEDULES

<u>CLASSIFICATION</u>	<u>CURRENT TOLL</u>
Auto, ambulance, hearse, motorcycle, tricar, or truck with single rear wheels, recreational vehicle	\$ 1.00
Convenience Book (20 tickets)	20.00
Convenience Book (20 tickets) for qualified handicapped persons	10.00
Automobile or truck with trailer	1.50
2-axle truck with dual rear wheels	1.50
3-axle truck vehicle	3.00
4-axle vehicle	4.50
5-axle vehicle	6.00
6-axle vehicle	7.50
7-axle vehicle	9.00
8-axle vehicle	10.50
9-axle vehicle	12.00
Bus (15 or more occupants including driver)	2.00
Commuter Bus	.10
District vehicles, employees, directors, CHP, club buses	FREE
Extra axles	FREE
Military vehicles	FREE
Autos with 3 or more occupants between 6-9 a.m. and 4-6 p.m. Monday through Friday	FREE

TABLE 2-2

FARE MATRIX

ZONES		1	2	3	4	5	6
1	Adult	.50	1.25	1.50	1.75	2.25	2.50
	Handicapped/Seniors	.25	.60	.75	.85	1.10	1.25
	Students	.25	.60	.75	.85	1.10	1.25
ZONES		1	2	3	4	5	6
2	Adult	1.25	#.50	#.50	#.50	1.50	1.75
	Handicapped/Seniors	.60	#.25	#.25	#.25	.75	.85
	Students	.60	*	*	*	.75	.85
ZONES		1	2	3	4	5	6
3	Adult	1.50	#.50	#.50	#.50	1.25	1.50
	Handicapped/Seniors	.75	#.25	#.25	#.25	.60	.75
	Students	.75	*	*	*	.60	.75
ZONES		1	2	3	4	5	6
4	Adult	1.75	#.50	#.50	#.50	1.00	1.25
	Handicapped/Seniors	.85	#.25	#.25	#.25	.50	.60
	Students	.85	*	*	*	.50	.60
ZONES		1	2	3	4	5	6
5	Adult	2.25	1.50	1.25	1.00	.35	.35
	Handicapped/Seniors	1.10	.75	.60	.50	.15	.15
	Students	1.10	.75	.60	.50	.25	.25
ZONES		1	2	3	4	5	6
6	Adult	2.50	1.75	1.50	1.25	.35	.35
	Handicapped/Seniors	1.25	.85	.75	.60	.15	.15
	Students	1.25	.85	.75	.60	.25	.25

Travel between East and West Marin (local fares, Zones 2, 3, & 4) is \$1.00 for Adults; 50¢ for Seniors or Handicapped persons; Students, two student discount tickets.

The division between East and West Marin are the intersections of Shoreline & Panoramic Highways, west of Mill Valley and Sir Francis Drake Blvd., at the summit of White's Hill west of Fairfax.

* One student discount ticket.

The discount fare for students in Marin County is only available through purchase of a 20 ticket book at \$7.00. If a student does not have a ticket, the Adult fare is paid.

TABLE 2-3

ALTERNATIVE TOLL STRUCTURES

Embodying the proposed increase in tolls applicable to private autos during the peak periods 7-9 a.m. and 4-6 p.m. Mondays thru Fridays except holidays.

Prime Focus Alternatives

Private Autos:	Existing	Alt A	Alt B	Alt C	Alt D
1 occupant	\$ 1.00	\$ 1.50	\$ 2.00	\$ 2.00	\$ 2.00
2 occupant	\$ 1.00	\$.75	\$ 1.00	Free	.50
3 occupant	Free	Free	Free	Free	Free

Note: Tolls for private autos at non-peak times and for other vehicles at all times would be unchanged.

FIGURE 2-1

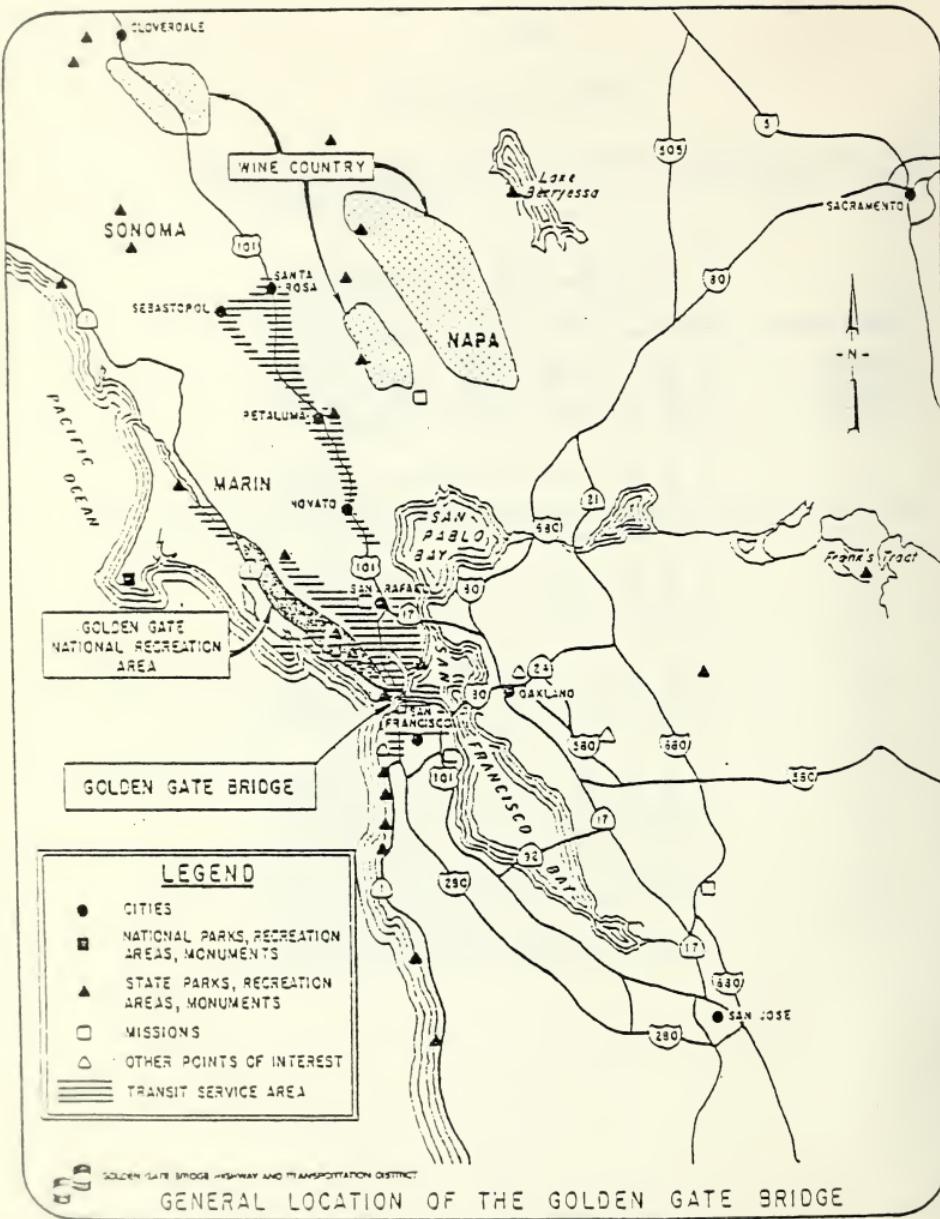


FIGURE 2-2

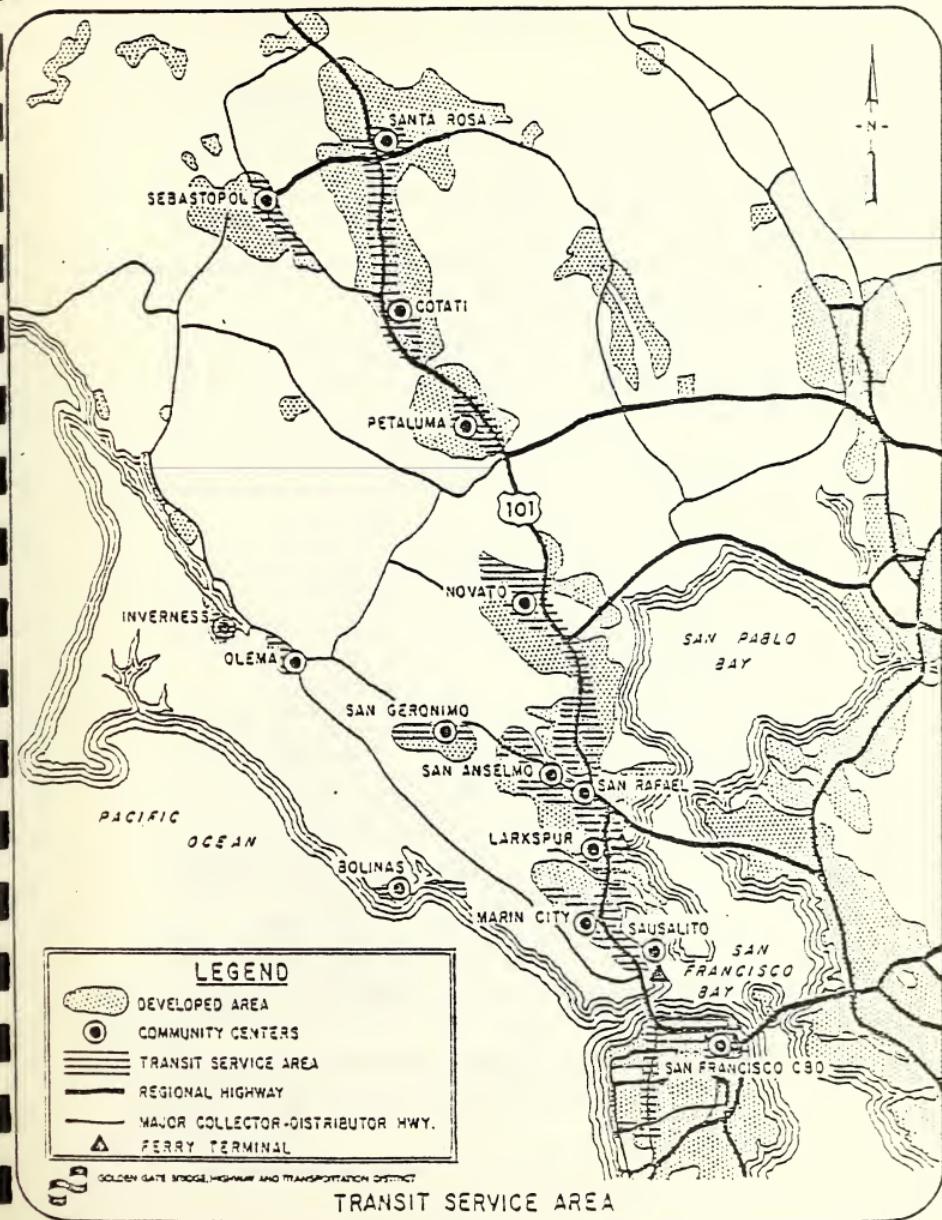
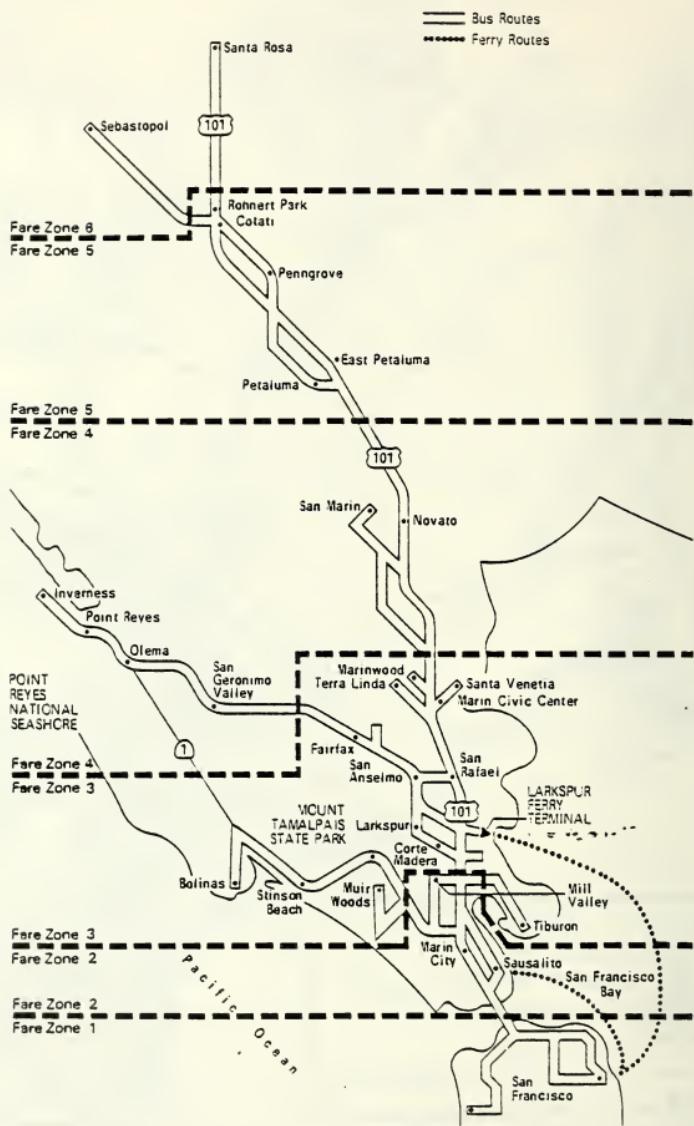


Figure 2-3

SYSTEM MAP



3.0 ENVIRONMENTAL SETTING

A description of the Golden Gate Bridge, Highway and Transportation District; its organization, historical development and transportation services, is included in Chapter 2 of the District's Five Year Transit Development Plan for Fiscal Years 1980/81 - 1984/85. (Reference 3) Copies of the Plan can be obtained from the Secretary of the District.

3.1 Land Use

The principal cities of the Bay Area's nine-county Region are San Francisco, Oakland, and San Jose. Seventy percent of the Region's 5.1 million population and 80 percent of its economic activity is located on the Bay Plain lands which adjoin the Bay shoreline. The greatest concentration of population is on the lands along the West Bay between San Francisco and San Jose and along the East Bay between San Jose, Oakland and Vallejo. The county-wide distribution of the Bay Area's population and land area is given in Table 3-1.

San Francisco, Oakland and San Jose are the region's principal centers of multi-functional urban activity. San Francisco is the region's dominant retail, trade, administrative, financial and distribution center. Twenty-six percent of the Bay Area's labor force is employed there. Although a majority of the labor force resides outside of San Francisco, residential densities within San Francisco are highest in the Region.

Elsewhere in the Bay Plain exist linear bands of industrial activity along the waterfront and regional sub-centers, including San Mateo, Redwood City and Sunnyvale in the West Bay and Fremont, Hayward and Richmond in the East Bay. Most commercial development, outside of major concentrations in San Francisco and Oakland and lesser concentrations in the CBD's of other cities, is located in strips along major transportation corridors or in clusters around shopping centers. Through the Plain, the high-density residential areas tend to be near major employment centers along the Bay shore while residential density decreases inland.

Suburban development in a number of sub-centers is characteristic of the rest of the Region. Bay Plain population has overflowed into southern Marin County, the Orinda-Walnut Creek-Concord area in Contra Costa County, the Livermore-Amador Valleys and up the Santa Clara Valley. These areas function mostly as bedroom communities to the employment centers of the Bay Plain.

A number of sub-centers, such as Novato, Vallejo and Antioch, have been created beyond the urban core by the location of steel, oil and chemical plants and military installations. Santa

Rosa and Napa function as important sub-regional service centers whose markets and populations are largely independent of the region's central core. Throughout the region's outer areas the cities are usually small and self-contained with diversified economic bases reflecting the influences of geography and local resources. Residential density in these outlying areas tends to be much lower than those of the urban core.

Urbanization in Marin County has been confined primarily to the Bayside valleys and the flatlands adjoining the Bay shores in southern Marin. Hills running perpendicular to the north-south oriented Bolinas Ridge and Marin Mountains act as barriers to contiguous development of the plain lands. The pattern of urbanization is characterized by the existence of physically discrete communities.

A similar situation exists in Sonoma County where the Petaluma-Cotati-Santa Rosa and Sonoma Valleys contain the bulk of urbanization. Agriculture is a more predominant land use in Sonoma and northern Marin. Most cities in these areas are separated by farm and pasture land as well as by topography.

West and northern Marin and much of Sonoma County possess some of the region's most valuable open space, recreational and agricultural resources. The Marin coast is the site of a number of national and state recreational areas such as Point Reyes National Seashore, Muir Woods National Monument, Golden Gate National Recreation Area, Mt. Tamalpais State Park and Stinson Beach. The Sonoma Coast and Russian River areas are popular recreation sites in Sonoma County. Both Marin and Sonoma Counties plan to preserve these natural portions of their environments .

3.2 Population and Employment

Table 3-2 indicates the portion of the population in low income, elderly and racial minority groups for Marin, Sonoma, and San Francisco counties and the nine-county region in 1970. Table 3-3 shows recent estimates of household income and population by group for the counties for 1979.

Marin County depends considerably upon employment outside of its boundaries. Currently, over 48 percent of Marin's 108,000 resident labor force work outside of Marin. Of these, over 90 percent commute south to San Francisco and beyond. Unlike Marin, about 15 percent of Sonoma's 131,700 labor force work outside of the county (about half of those commute to San Francisco). Unemployment rates in August, 1980 were 4.8 percent in Marin, 8.4 in Sonoma, and 7.8 percent in San Francisco counties. The average unemployment rate for all California metropolitan areas was 7.2 percent.

3.3 Climate and Air Quality

Most of the nine-county San Francisco Bay Area, all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Napa, and portions of Solano and Sonoma, comprise the San Francisco Bay Intrastate Air Quality Control Region (AQCR). The maintenance of air quality in the AQCR is the responsibility of the Bay Area Air Quality Management District (BAAQMD).

The San Francisco Bay Area climate is typical of California coastal zones. Most summer days are dry and sunny. Spring weather is variable. Late fall and winter are cool and windy and receive most of the area's moderate rainfall. Wind patterns vary with location, time of day and season (see Figure 3-1). The most frequent daytime pattern is a moderate sea breeze off the coast and Bay. The wind direction frequently reverses to a land breeze in the evening. Air movement and stability are usually dominated by the Pacific high pressure zone. Light winds and downward vertical flow caused by high pressure areas, combined with the topography of the Bay Area, a large shallow basin ringed by hills, can result in a heavy build-up of photochemical smog.

Air quality may be assessed in terms of the concentrations of various pollutants. Air pollutants most commonly measured are (1) carbon-monoxide (CO); (2) oxides of nitrogen (NO_x); (3) oxidant, primarily ozone (O_3); (4) hydrocarbons (HC); (5) sulfur dioxide (SO_2); and (6) particulates. When air quality is expressed in terms of the frequency that certain levels are equaled or exceeded, the levels are based on either state or federal standards. These standards are summarized in Table 3-4.

Under the weather conditions causing "inversion", pollution may be the heaviest. Inversion is characterized by a cool layer of air trapped below a layer of warm air, a reversal of the atmosphere's normal decrease of temperature with altitude. Summer inversions are caused by downward vertical motion (subsidence) which compresses and heats the air. Winter inversions are formed as air warmed by radiation is cooled as it comes in contact with the earth's cold surface at night. Both types may combine during the fall, resulting in the worst pollution. The inversion prevents pollutants from diluting in the vertical air mass and confines them to air that is breathed.

The inversion and wind speed together determine the total volume of air available to dilute the pollutants. Poor ventilation usually creates a "smog season" during the warm and sunny months from May to October (see Figure 3-2).

Oxidant, a component of photochemical smog, is a by-product of NO_x and HC, formed in the presence of sunlight downwind from the

primary NO_x and HC emissions. Motor vehicles contributed between 34 percent and 44 percent of the precursors of smog in 1971 (Figure 3-3). An area of low average oxidant concentration is centered over San Francisco. Values tend to increase as one goes away from San Francisco northwest toward Sonoma and Napa Valley; northeast through the Carquinez Strait; eastward through Dublin and Niles Canyon and into the Livermore Valley; and southeasterly along the sides of the Bay into the Santa Clara Valley.

Carbon-monoxide typifies primary pollutants that are emitted directly into the atmosphere from motor vehicles. It is most inert so that the observed concentrations represent only the effects of dilution in the atmosphere. Motor vehicles constitute the most important source of CO, as shown in Figure 3-3. Thus, it is not surprising that the highest CO concentrations are in the vicinity of major roadways such as Highway 101, including the San Francisco and Marin County approaches to the Golden Gate Bridge. CO reaches peak levels in the late fall and winter due to surface-based temperature inversions, increased space heating requirements and mobile sources.

Tables 3-5, 3-6, and 3-7 summarize regional emissions by source, county and station. According to the Bay Area Air Quality Management District, in 1979 there were no excesses of any sulfur dioxide standard. For carbon monoxide, the one hour Federal standard was never exceeded. The 8 hour standard was exceeded on 21 days in 1979 (compared to 24 days in 1978 and 41 days in 1977). There were no excesses of the state nitrogen dioxide standard in 1979 for the first time in 13 years of continuous monitoring. For only the second time in 18 years, ozone values did not reach Health Advisory/Alert level. There were 15 days exceeding the Federal standard (compared to 34 days in 1978 and only 7 days in the 1977 drought year).

3.4 Energy

This year the U.S. is expected to spend \$90 billion on foreign oil, an average of \$400 for every person in the country. These expenditures depress the value of the dollar on international markets and push up inflation in the U.S.

In 1978, the U.S. accounted for 21 percent of world petroleum production, but it consumed 36 percent. Petroleum industry forecasts show no increase in U.S. oil production through 1990.

Therefore, to effect a reduction of U.S. dependency on oil imports will require a reduction of U.S. oil consumption. Automobiles account for over 20 percent of U.S. petroleum consumption.

Significant reductions in oil imports can be achieved through conservation measures related to automobile manufacture and use.

Studies have shown that transportation-related energy consumption is influenced by a number of variables:

VEHICLE: Weight, body size and shape, tires (type, size, inflation), engine size (horsepower) and design; accessories, maintenance and repair.

ROADWAY: Distance, gradients, horizontal curvature, speed and speed changes (stops and slowdowns), roadway surface and extensiveness of high-type highway network.

TRAFFIC: Volumes, level of service, composition (automobile, bus, freight-hauling vehicles).

OWNER/OPERATOR: Driving habits, trip purposes, income.

SOCIOECONOMIC: Population, income distribution, age distribution, real costs of capital investment and expenses of vehicle.

LAND USE PATTERNS: Density and development of pattern.

MODAL ALTERNATIVES: Availability of public transportation, provisions for bicycles and pedestrians, railroads, air and water transportation.

WEATHER AND ALTITUDE: Weather effects on speed, effects of altitude on air resistance and engine performance.

PUBLIC POLICY: Taxation and pricing of vehicles, fuel rationing, speed limitations, programs to increase vehicle occupancy, transportation investment programs, energy efficiency standards, and air and noise pollution control programs.

Table 3.8 compares energy efficiency for alternative transportation modes.

The County of Marin is currently considering adopting an Energy Element to their county-wide plan. According to figures prepared by Sedway/Cooke, consultants to the county, automobile trips account for 94 percent of the total energy consumed for transportation during an average weekday in Marin County. Figure 3.4 shows total Marin County energy use in 1978 by source. Transportation accounted for 54 percent of total county energy consumption in 1978.

3.5 Golden Gate Bridge and U.S. 101 Highway Travel

Two highways provide the principal connection between San Francisco and the coastal regions of California. California State Route 1 closely follows the Pacific coastline from southern California along

the San Francisco Peninsula, across the Golden Gate Bridge and northward along the coastline to Oregon. U.S. Route 101 follows the most populated valleys within the Coastal Range from southern California, then along the western shores of San Francisco Bay across the Golden Gate Bridge and continues along the western Bay shore and the valleys of the Coastal Range, to join State Route 1 some 160 miles north of San Francisco. With the opening of the Golden Gate Bridge in 1937, these routes rapidly became the principal connections between the timber, wine, agricultural and recreational industries of the counties north and south of San Francisco. The location of major agricultural and recreational areas in the vicinity of the Golden Gate Bridge is shown in Figure 2-1.

The State's principal north-south highway, Interstate Route 5, is located along the San Joaquin Valley, east of the San Francisco Bay Area. The principal route eastward from the San Francisco Bay Area, Interstate Route 80, is located along the eastern Bay shores. The most direct connections to these routes from the Bay Area's major population areas do not cross the Golden Gate Bridge. Thus, the Golden Gate Bridge is predominantly a link in the north-south coastal highway network.

While vehicles crossing the Golden Gate Bridge originate from and are destined for all parts of the North American Continent, there is generally a greater use of the facility by vehicles originating from points of closer proximity. The most recent data indicating the distribution of users by place of vehicle registration is shown in Table 3-9. Approximately 75% of the Golden Gate Bridge users reside in four counties of the nine-county Bay Area.

Historic trends in Golden Gate Bridge vehicular traffic are illustrated in Figure 3-5. Vehicular traffic increased at approximately 7 percent per annum between 1950 and 1968. Between 1968 and 1972, the rate of growth dropped to 3 percent per year. With the introduction of Golden Gate Transit bus service in 1972, traffic increased less than 2 percent and then dropped 1/2 percent in 1973. This was the first reduction in traffic since 1944. With the first Arab oil embargo, traffic decreased an additional 6 percent in 1974. Traffic growth resumed in 1975 and 1976 at over a 4 percent increase per year, but then eased in 1977 and 1978 with +1% and +2.4% growth. The gasoline shortage and price increase in 1979 resulted in another traffic reduction, this time of -2.7 percent. For the first half of 1980, traffic is unchanged from 1979. About 35.8 million vehicles are projected to cross the Bridge during FY 1980/81. Traffic is projected to grow at a rate of 1 percent per year over the next five years.

Morning commute period Bridge traffic into San Francisco has followed a trend similar to that of total Bridge traffic. Table 3-10 shows southbound commute period traffic since the initiation of Golden Gate Transit bus service in FY 71/72. In the years prior to the transit operation, commute period auto traffic increased steadily

to the 21,000 level. The commuter shift to transit brought auto traffic down 5 percent by FY 1973/74. But, by FY 76/77, traffic had risen back to and above 1970 levels and in FY 77/78 broke the 21,000 vehicle mark. The May, 1979 gasoline shortage and subsequent gasoline price increases caused a reduction in traffic in FY 78/79 and again in FY 79/80. However, commute period traffic is projected to increase over 1 percent per year. Thus, by FY 85/86 morning commute period traffic will be up at the 22,000 level again. Figure 3.6 shows the current distribution of vehicles within the 6 to 10 a.m. commute period.

While traffic and congestion on the Golden Gate Bridge had lessened recently, problems continue to exist on U.S. 101 to the north. Figure 3-7 from a recent Caltrans study of the U.S. 101 corridor shows the locations of traffic congestion southbound on U.S. 101 during the 7-8:30 a.m. peak and northbound during the 4:30-6:30 p.m. peak periods. The southbound traffic bottleneck in San Rafael currently provides a restraint on traffic bound for the Golden Gate Bridge enabling traffic to flow rather smoothly through southern Marin to the Bridge Toll Plaza. According to the Caltrans study, traffic on U.S. 101 in San Rafael and northward is expected to grow between 18 and 25 percent in the next ten years. Plans to establish high occupancy vehicle lanes through the congested area have been given high priority by Caltrans, the District, County of Marin and other agencies.

3.6 Golden Gate Public Transportation Services

A description of the Golden Gate bus, ferry, and ridesharing systems is given in Section 2.1 of this report. The Golden Gate Transit service area is illustrated in Figure 2-2. A map of the Golden Gate Transit bus and ferry systems is shown in Figure 2-3. In general, Golden Gate Transit provides transbay service between Marin and Sonoma Counties and San Francisco. Golden Gate Transit buses provide local service to portions of Marin County on a contract basis with the Marin County Transit District. A history of transit patronage is shown in Table 3-11.

The principal components of the regional transit network are illustrated in Figure 3-8. In addition to Golden Gate services, Greyhound and a number of private charter bus companies also serve the north-west bay transportation corridors. Harbour Carriers provides additional ferry service between Marin and San Francisco counties. Golden Gate passengers traveling to San Francisco can conveniently transfer to the other transit operators in the region: San Francisco Municipal Railway (MUNI), Alameda-Contra Costa Transit (AC Transit), San Francisco Bay Area Rapid Transit (BART) and San Mateo County Transit (SamTrans).

Tables 3-12 and 3-13 show the levels of transit and auto usage during the 6-10 a.m. commute period into San Francisco over the

past 5 years. Last year over 43 percent of the 40,000 commuters used public transit or carpooled into San Francisco. Nearly 80 percent of total transit seating capacity between 6-10 a.m. is being utilized. During the peak hours (7-9 a.m.) transit passengers use over 90 percent of available seating capacity (about 7,500 out of 8,000 available bus seats and about 1,000 out of 1,400 ferry seats). Most Golden Gate Transit buses are currently overcrowded (standing room only) in the peak hour. In contrast, only 7 percent of peak period autos have 3 or more occupants. An additional 21,000 persons could commute in carpools during the 7-9 a.m. peak if all the single and double occupant autos carried one or two more passengers.

3.7 Transbay Traveler Characteristics

Socioeconomic characteristics of these transbay travelers are presented in Tables 3-14, 3-15, and 3-16.

The April 1980 "Single Occupancy Driver and Ferry Rider Attitudinal Survey" conducted by ADF Research provides information on the single occupant auto traveler's need to commute by automobile. In response to the question, "Do you need your car for work?", 50 percent of drivers said "Yes." Of these 50 percent, 27 percent said yes because they made sales calls or visited clients, 8 percent said they needed a car to get to job sites or carry tools, and 5 percent needed their car for pickups or deliveries. However, when asked the question, "Why don't you use bus or ferry?", only 26 percent of drivers responded, "Need car for work", and another 6 percent said, "Need flexibility of car." Also, when asked to give their occupation, only 10 percent were in sales, 3 percent were consultants and 5 percent were craftsmen. No one reported a delivery/pickup related job. Therefore, it appears that between 25 and 35 percent of single occupant auto commuters presently require their cars for work.

In general, the typical person commuting transbay in a single occupant auto or on the ferry or by bus have some similar characteristics. They are between the ages of 25 and 44, male, live in Marin County and have a household income of between \$25,000 and \$35,000 (in 1980 dollars). Auto commuters as a group have higher incomes than transit commuters.

3.8 GGBHTD FISCAL CHARACTERISTICS

3.8.1 Five Year Financial Projection

A five year projection of the District's expenses, revenues and reserves is presented in Table 3-34. It is based on the adopted FY 80/81 District budget adjusted through October, 1980. Expenses over the subsequent five year period are inflated according to MTCs recommended SB 842 guidelines: +8 1/2 percent per year for labor, plus 10 percent per year for materials and supplies and plus 15 percent per year for fuel. Toll, farebox and other passenger revenues are derived from District staff projections of transit patronage and Bridge traffic. Funding from non-District revenue sources (i.e., state and federal subsidies) is projected on the basis of MTC estimates of regional funding allocations over the five year period. A detailed discussion of the District's finances is presented in Appendix A. Brief descriptions of the District's sources of expense and revenue follow.

3.8.2 District Expenses

The District's expenses are incurred from the normal operation of its four divisions: Bridge, Bus, Ferry and Ridesharing; from the maintenance of its facilities and equipment, e.g., Bridge painting and bus and ferry maintenance; from capital purchases, e.g., ferry vessel parts, new buses and Bridge deck replacement; and from the administration and management of the District's employees property, plant and equipment. The District expended \$34,112,000 for operations and maintenance in FY 79/80, up 4.6% from FY 78/79. This modest increase in expenditures reflects the District's efforts to hold down its expenses through efficient operation.

3.8.3 District Revenues

The District's revenues are generated primarily from the District's direct sources. Operating revenues consist of tolls from vehicles crossing the Golden Gate Bridge into San Francisco, fares from transit passengers, concessions from food and beverage sales on the ferries, concessions from advertising on District properties, and miscellaneous fees collected. Income is also derived from short term investments of District reserve monies. In FY 79/80, these local revenues accounted for over 84% of total District revenue.

The remainder of the District's revenues come from local and non-local sources outside of the District's control. It is District policy to exploit outside funding sources to the maximum extent possible.

In FY 79/80, the District received \$4 million of State SB 325 Transportation Development Act(TDA) funds. These funds are derived from the state sales tax (1/4% of the 6% tax) and allocated to the counties for transit and highways. The District receives portions of the monies allocated to Sonoma, Marin and San Francisco. The portion is determined by MTC on the basis of claims filed by eligible applicants within each county.

The District received \$0.5 million to cover fuel price increases from a relatively new state funding source called SB 620 State Transit Assistance (STA), in FY 79/80. STA funds are allocated to the region and then distributed by MTC. The STA funds are available only through FY 81/82. The funds are primarily for capital projects.

Federal funds are available for transit from Sections 3, 5, 6, 8, 10, and 18 of the Urban Mass Transportation Act (UMTA) of 1964, as amended. The District receives operating assistance annually through Section 5. Section 5 monies are allocated to the SF/Oakland and Santa Rosa urbanized areas by a formula based on population. The District applies to the state for the Santa Rosa funds and to MTC for the San Francisco funds. The District received \$1.35 million of Section 5 operating funds in FY 79/80. All other UMTA funds are awarded at the discretion of the Urban Mass Transportation Administration with the

recommendation of MTC and the state.

Federal funds for transit are also available through the Federal Highway Administration's (FHWA) Federal Aid Urban (FAU) program. These funds are allocated to the counties and distributed by county committee.

Though varying from county to county, most FAU monies are used for highway purposes. Within recent years, more money has been made available for transit use, but it is restricted to capital projects. The funds are administered by Caltrans.

3.9 Local and Regional Plans and Policies

The County of Sonoma recently adopted a Five Year Public Transportation Plan. The following goals are contained in the Plan:

- . Develop a countywide system of public transportation services that provides for the travel needs of Sonoma County residents, with initial priority given to the unmet needs of the elderly, handicapped and transit dependent residents.
- . Develop a cost-effective and efficient combination of public transportation alternatives to the single-occupant automobile.
- . Maximize coordination among local and inter-city transit and special elderly/handicapped paratransit services.
- . Develop a countywide system of transportation services incrementally, on the basis of a careful and continuous evaluation of the demonstrated effectiveness of a variety of different services.
- . Develop a public transportation system that supports the goals and policies of the General Plans of the Cities and Sonoma County.
- . Provide the general public (particularly elderly, handicapped and transit dependent individuals) with a level of public transportation services that assures reasonable and adequate access to major trip destinations.
- . To minimize the need for long distance inter-county travel, particularly work trips, by guiding the development of a self-sufficient county having balanced service facilities, employment, and housing.
- . To develop a public transportation system compatible with the environment, promoting the aesthetic beauty of the region, and avoiding undesirable environmental changes.

- To develop a public transportation system that is financially, politically, and legally feasible having community support and a commitment by elected officials to provide services.
- Conserve energy in the County through increased public transportation ridership, ridesharing, bicycling, and pedestrian travel.
- Maximize the utilization of volunteer services whenever possible in the delivery of paratransit services.

The County of Marin is currently in the process of updating its Countywide Plan. Major Transportation Policy recommendations contained in the third draft of the Countywide Plan revision are as follows:

- A-1 The majority of transportation program expenditures should be restricted to the most energy-efficient modes of transportation such as high occupancy vehicle (HOV) programs, transit services, and bicycle and pedestrian facilities.
- A-2 Local governments should find ways to encourage people to use more energy-efficient transportation such as: preferential parking for carpools and vanpools, safe bicycle routes, park-and-ride lots for commuters, etc.
- A-3 Private developers and employers and large public employers, such as county government and school districts, should explore programs such as: vanpools, carpools, subscription bus service, staggered or flex-time work hours, transit use incentives for employees, provision of shower facilities for employees who bicycle or jog to work, etc.
- B-1 The scale, location, and pace of development of transportation services should support the Plan's goals of controlled growth, economic self-sufficiency, and high quality natural environment.
- B-2 Energy-efficient modes of transportation should be expanded to accommodate the travel demands projected under existing local development plans. Freeway and local street expansion for single occupant vehicles is not recommended.
- C-1 Reduction in the use of the single occupant automobile should be encouraged by increasing use of high-occupancy vehicles (carpools and vanpools), public transit, and non-motorized modes such as bicycles and walking.
- C-2 Increased use of carpools should be encouraged with a goal of 100% expansion for local travel and 50% expansion for transbay trips from the rates found in 1980.
- C-3 Public transit should be expanded by one-third for transbay travel and in accord with the Local Transit Services Plan prepared by the Marin County Transit District in fall 1979 for

local transit.

- D-1 Most bottlenecks on Highway 101 should be relieved over the 20 year planning period. Because of funding and energy limits, bottlenecks should be relieved first for energy-efficient, high occupancy vehicle (HOV) modes and as a second priority for single occupant vehicles if sufficient funding can be made available.
- D-2 A system to permit energy-efficient HOV traffic to bypass the most congested portions of Highway 101, including direct access for HOV traffic to local job centers, should be first priority for the development of Highway 101.
- D-3 Because of limited funding programs, minimum cost methods, such as restriping to sub-standard lane widths, should be used whenever possible to gain added pavement needed for HOV traffic.
- D-4 The automobile capacity of the Golden Gate Bridge should be maintained at the existing levels.
- D-5 The Northwestern Pacific Railroad right-of-way or an equivalent parallel route should be preserved for ultimate use as a transportation corridor.
- D-6 The existing Golden Gate Transit bus fleet should be expanded and the ferry system should be aggressively marketed with the intent of increasing ridership during the commute period. If, after a reasonable time period, the ferry service is not able to meet the desired passenger levels, consideration should be given to abandoning the ferry system in favor of added bus service.

The proposed plan revision suggests several approaches to financing needed HOV and transit improvements, one of which is to:

"Charge the users of systems a greater share of the costs when expansion is needed. For example, the costs of transporting people across the Golden Gate should be borne by those using the crossing. The Golden Gate Bridge District should consider increased tolls for single occupant vehicles both to encourage energy conservation and to fund expansion of transit, carpool, and vanpool programs."

The San Francisco County and City Transportation Element of the General Plan contains the following policies pertaining to the Golden Gate Corridor:

- (1) POLICY 1: Build and maintain rapid transit lines from downtown to all suburban corridors and major centers of activity in San Francisco.
- (2) POLICY 2: Where significant, transit service as provided by buses, bridges, and freeways should have exclusive bus lanes.
- (3) POLICY 3: Provide transit service from residential areas to major employment centers outside the downtown area.
- (4) POLICY 4: Continue ferries and other forms of water-based transportation as an alternative mode of travel between San Francisco and the North Bay.

Regional policies pertinent to the area's transportation systems are contained in the Regional Transportation Plan (RTP) developed by the Metropolitan Transportation Commission (MTC). The 1979 RTP includes the following transportation system objectives and policies:

OBJECTIVE A:

Transportation programs shall consist of well-coordinated multimodal systems to meet demonstrated travel demand which is consistent with policies of other regional agencies.

OBJECTIVE B:

Transportation programs will be designed to reduce dependence on the automobile as a transportation mode.

OBJECTIVE C:

More efficient use of existing transportation facilities shall be explored as an alternative to construction of new facilities.

A multimodal transportation system preserves a wider range of choice and satisfies a larger number of transportation needs than a single mode. In order to achieve a truly balanced multimodal system it is necessary to give added emphasis to developing the transit mode as a real alternative. This requires special consideration of facilities and programs that are directed toward narrowing the existing gap between the availability of choice of travel mode between transit and personal auto.

POLICY 1.1

MTC shall emphasize the development of public transit to provide a level of mobility within this mode that is more reasonably comparable to that afforded by the privately owned automobile.

POLICY 1.7

Transit shall meet peak-hour travel demands to major activity centers, assuring reasonable comfort and convenience.

POLICY 1.8

Transportation programs shall support equal opportunity for all residents to have economical access to jobs, social services and recreational activities.

A major problem presently confronting core areas of the Region is congestion from automobile use. The convenience of driving an automobile, coupled with the decline of transit services, has caused greater reliance on the automobile. Transit must be made more attractive and convenient so that automobiles will be relatively less attractive for use in core areas; this will facilitate movement of pedestrians and goods. In addition to transit improvements, some incentives geared toward discouraging automobile use must be instituted so that auto-dominance is reduced within these congested areas.

POLICY 1.19

Changes in working patterns (such as adoption of staggered or flexible working hours) shall be encouraged in order to reduce peak hour travel demands by spreading them over a broader time base.

In addition to these local and regional plans and policies, the National Task Force on Ridesharing formed by President Carter in October, 1979 has issued a report entitled "Ridesharing: Meeting the Challenges of the 80's." The Task Force recommends that Public Officials at the regional and local level:

1. Give Federal Aid funding priority to implement high occupancy vehicle strategies in urban areas over 200,000 population.
2. Implement differential toll pricing programs to favor ridesharing vehicles on bridges, tunnels and at publicly-owned parking facilities.
3. Develop and implement parking management policies and programs for both on-street and off-street public or private facilities, including providing preferential spaces and/or rates and amending zoning ordinances and building codes to encourage ridesharing.

TABLE 3-1

SAN FRANCISCO BAY AREA POPULATION AND LAND AREA

County	Population 1980	% of Bay Area Population	Area (mi ²)	% of Bay Area Land	Population Density (Persons/mi ²)
Alameda	1,098,500	21.7	726	10.4	1,500
Contra Costa	645,300	12.7	751	10.8	900
Marin	225,200	4.4	511	7.3	400
Napa	93,400	1.8	743	10.7	700
San Francisco	642,900	12.7	47	.7	13,700
San Mateo	589,200	11.6	448	6.4	1,300
Santa Clara	1,265,200	25.0	1326	19.1	1,000
Solano	225,500	4.4	826	11.9	300
Sonoma	284,400	5.6	1575	22.7	200
Bay Area TOTAL	5,069,500	100.0	6953	100.0	729

Source: Population: California State Department of Finance Estimates for January, 1980.
 Land Area: Bay Area Transportation Report, Bay Area Transportation Study Commission,
 May, 1979.

TABLE 3-2
DISTRIBUTION OF POOR, ELDERLY AND MINORITIES

Group	SF Bay Area 9-County Region	San Francisco	Marin	Sonoma
<u>Racial Minorities</u>				
Spanish-Surname	13%	14%	6%	7%
Black	8%	13%	2%	1%
Asian	5%	13%	1%	1%
<u>Persons 65 & Older</u>	8.9%	13.9%	8.7%	12.9%
<u>Percent of Households with Incomes Below Poverty Level (\$3,700 for a non-farm family of 4)</u>				
	9.4%	14.6%	9.2%	15.8%

Source: 1970 Census of Population

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TABLE 3-3
POPULATION, INCOME AND AGE

	1979 Figures		Countywide	
	SF/Oakland Metro Area	SF	Marin	Sonoma
Population	3,222,700	647,000	226,000	282,500
Households	1,311,100	315,500	87,600	108,700
Median Household (HH) Effective Buying Income (EBI)	\$20,827	\$16,518	\$24,844	\$17,078
% HHs with EBI				
under \$8,000	17.5%	23.8%	12.2%	25.6%
\$8,000-\$9,999	4.3%	5.5%	3.4%	5.6%
\$10,000-14,999	12.1%	15.9%	10.0%	13.2%
\$15,000-24,999	28.0%	26.6%	24.9%	28.4%
\$25,000+	38.1%	28.2%	49.5%	27.2%
Median Age	31.8	34.4	32.4	32.3
% Population in Age Group				
18 under	23.8%	17.8%	23.9%	27.0%
18-24	13.9%	14.9%	11.3%	11.9%
25-34	18.1%	18.5%	20.0%	15.3%
35-49	17.7%	15.8%	20.6%	15.4%
50+	26.5%	33.0%	24.2%	30.4%

Effective Buying Income (EBI) = total income (wages, dividends investments...) minus personal taxes minus nontax payments (fines, fees, etc.) and is also known as "disposable" income.

Source: Sales and Marketing Management, 1980 Survey of Buying Power, July 28, 1980.

TABLE 3-4

AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary ¹	Secondary ²
Oxidant	1 hour	0.10 ppm 200 $\mu\text{g}/\text{m}^3$	--	--
Ozone	1 hour	--	0.12 ppm 240 $\mu\text{g}/\text{m}^3$	Same as primary standards
Carbon Monoxide	12 hours	10 ppm 11 mg/m ³	--	--
	8 hours	--	9 ppm 10 mg/m ³	Same as primary standards
	1 hour	40 ppm 46 mg/m ³	35 ppm 40 mg/m ³	Same as primary standards
Nitrogen Dioxide	Annual Average	--	0.05 ppm 100 $\mu\text{g}/\text{m}^3$	Same as primary standards
	1 hour	0.25 ppm 470 $\mu\text{g}/\text{m}^3$	--	--
Sulfur Dioxide	Annual Average	--	0.03 ppm 80 $\mu\text{g}/\text{m}^3$	--
	24 hours	0.05 ppm 131 $\mu\text{g}/\text{m}^3$	0.14 ppm 365 $\mu\text{g}/\text{m}^3$	--
	3 hours	--	--	0.5 ppm 1300 $\mu\text{g}/\text{m}^3$
	1 hour	0.5 ppm 1310 $\mu\text{g}/\text{m}^3$		
Suspended Particulate	Annual Geometric Mean	60 $\mu\text{g}/\text{m}^3$	75 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$
	24 hours	100 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$
Hydrocarbons	3 hours (6-9 a.m.)	--	0.24 ppm 160 $\mu\text{g}/\text{m}^3$	Same as primary standard

ppm - parts per million

 $\mu\text{g}/\text{m}^3$ - micrograms per cubic metermg/m³ - milligrams per cubic meter1. National Primary Standards: The levels of air quality necessary, with

TABLE 3-4 (continued)

an adequate margin of safety, to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency (EPA).

2. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standard within a "reasonable time" after implementation plan is approved by the EPA.

Source: California Air Quality Data Annual Summary 1979.

TABLE 3-5

EMISSION AND AIR QUALITY INFORMATION

On this and the following pages are charts and tables based upon records and estimates made by the staff of the Bay Area Air Pollution Control District. Because of independent rounding, totals may not equal exactly the sums of their parts. The symbol (—) indicates a quantity which is relatively insignificant.

Annual average emissions in the nine-county District for 1975 and their percent distribution by source category are shown below.

TOTAL EMISSIONS -TONS/DAY					
Particulate	Organics	Nitrogen Oxides	Sulfur Oxides	Carbon Monoxide	
180	1000	660	220	3700	
PERCENT DISTRIBUTION OF EMISSIONS					
	PART.	ORG.	NO _x	SO ₂	CO
LOCALLY CONTROLLED SOURCES					
Petroleum Refining	3.5	7.5	6.9	21.5	—
Gasoline Bulk Loading	—	1.6	—	—	—
Service Stations	—	4.4	—	—	—
Chemical & Other Ind.	27.9	1.5	.6	38.3	1.6
Painting, Coating, Etc.	—	16.2	—	—	—
Solvent Degreasing	—	4.3	—	—	—
Dry Cleaners	—	1.4	—	—	—
Rubber, Plastic Products Mfg.	—	4.7	—	—	—
Other Solvent Usage	—	4.1	—	—	—
Metallurgical & Mineral Ind.	17.9	—	.3	2.7	—
Domestic Fuel Usage	2.5	—	3.4	—	—
Commercial Fuel Usage	.7	—	1.0	—	—
Industrial Fuel Usage	1.4	.3	9.6	3.1	.4
Electrical Generating Plants	2.5	—	9.9	12.8	—
Agric. Burning & Incineration	1.8	.7	.1	.1	.4
Accidental Fires	5.5	1.3	.1	—	1.2
Agricultural Tractors	.5	.4	1.3	.7	1.5
Construction Equipment	1.6	.7	5.9	2.4	2.7
Ships	.4	.2	.8	8.2	—
Locomotives	.2	.2	.8	.4	.1
Other Engines	.2	3.1	.3	.1	3.3
Sub-total	67%	53%	41%	90%	11%
STATE/FEDERAL CONTROLLED SOURCES					
Air Carriers	3.0	1.0	1.3	.4	.5
General Aviation	.5	.4	.2	—	.5
Military Aircraft	1.7	.5	.5	.2	.4
Cars & Light Duty Trucks	23.6	32.2	44.6	4.3	66.5
Heavy Duty Trucks & Buses	4.2	12.1	12.5	4.5	19.4
Motorcycles	.2	1.3	.1	—	1.4
Sub-total	33%	47%	59%	10%	89%
TOTAL EMISSIONS		100%	100%	100%	100%

Source: Air Pollution and the San Francisco Bay Area,
Bay Area Air Pollution Control District, June 1977

TABLE 3-6

EMISSIONS BY COUNTY — 1975

All values below are shown to only 2 significant figures as an indication of their certainty. Because of independent rounding, totals may not always equal exactly the sums of their parts.

	Part	Org.	TONS/DAY		
			NOx	SO ₂	CO
ALAMEDA					
Locally Controlled Sources	24	110	36	11	76
State/Fed. Controlled Sources	13	112	95	5	799
Total	37	222	130	17	875
CONTRA COSTA					
Locally Controlled Sources	26	130	130	130	110
State/Fed. Controlled Sources	5	50	38	2	322
Total	31	180	150	132	452
MARIN					
Locally Controlled Sources	4	17	4	0	13
State/Fed. Controlled Sources	3	27	24	1	204
Total	7	44	27	2	220
NAPA					
Locally Controlled Sources	4	9	2	1	11
State/Fed. Controlled Sources	1	8	7	0	53
Total	5	17	6	1	63
SAN FRANCISCO					
Locally Controlled Sources	13	57	25	13	42
State/Fed. Controlled Sources	5	47	35	2	330
Total	18	104	59	15	372
SAN MATEO					
Locally Controlled Sources	10	52	11	2	37
State/Fed. Controlled Sources	10	58	51	3	318
Total	20	110	62	5	355
SANTA CLARA					
Locally Controlled Sources	24	110	44	5	81
State/Fed. Controlled Sources	14	124	93	5	852
Total	38	234	137	10	933
SOLANO					
Locally Controlled Sources	5	25	14	41	22
State/Fed. Controlled Sources	4	24	23	1	156
Total	9	49	37	42	180
SONOMA					
Locally Controlled Sources	7	21	5	1	22
State/Fed. Controlled Sources	3	30	25	1	222
Total	10	50	30	2	250
TOTAL — NINE COUNTIES					
Locally Controlled Sources	117	531	271	204	414
State/Fed. Controlled Sources	58	480	391	20	3256
Total	175	1010	654	224	3670

Source: Air Pollution and the San Francisco Bay Area,
Bay Area Air Pollution Control District, June 1977

**AIR POLLUTION IN THE BAY AREA
BY STATION AND CONTAMINANT: 1976**

For oxidant and for nitrogen dioxide, "max" is the highest hourly average value expressed in parts per hundred million. For carbon monoxide, "max" is highest 8-hour average value in parts per million. (The one-hour standard for CO was never exceeded during the year.)

For sulfur dioxide, "max" is highest 24-hour average value expressed in parts per million. For total suspended particulates (TSP), "mean" is annual geometric mean in micrograms per cubic meter.

Stations	OXIDANT			CO		NO ₂		SO ₂		Suspended Particulates	
	Max	*	Max**	Max.	*	Max.	*	Max.	*	Mean	:
San Francisco	13	2	3	11.0	4	25	1	.053	1.3	55	9.3
San Rafael	12	5	3	15.5	7	13	0	.015	0.0	36	5.4
Richmond	13	7	9	9.3	0	23	0	.013	0.0	48	12.0
Pittsburg	15	29	22	5.5	0	19	0	.015	0.0	61	16.0
Concord	17	24	—	7.4	0	23	0	.030	0.0	51	12.8
Walnut Creek	14	10	28	—	—	—	—	—	—	—	—
Oakland	15	6	7	10.5	7	—	—	—	—	—	—
San Leandro	16	9	23	—	—	—	—	—	—	—	—
Hayward	18	30	—	—	—	—	—	—	—	—	—
Fremont	16	21	39	9.8	1	28	2	.011	0.0	52	13.1
Livermore	17	29	60	7.1	0	18	0	.005	0.0	85	41.3
Alum Rock	16	31	—	—	—	—	—	—	—	—	—
San Jose	17	32	40	20.2	61	28	3	.015	0.0	71	20.8
Gilroy	21	30	—	6.3	0	23	0	.011	0.0	62	11.7
Los Gatos	14	19	32	—	—	—	—	—	—	—	—
Sunnyvale	15	22	—	12.9	14	30	4	.008	0.0	50	8.5
Mountain View	14	11	12	—	—	—	—	—	—	—	—
Redwood City	17	16	15	10.2	10	21	0	.007	0.0	59	13.0
Burlingame	15	3	10	9.5	1	22	0	.018	0.0	49	7.0
Petaluma	9	5	6	—	—	—	—	—	—	—	—
Santa Rosa	9	1	—	9.5	1	15	0	.004	0.0	66	8.6
Sonoma	13	21	—	—	—	—	—	—	—	—	—
Napa	12	16	16	10.8	2	11	0	.009	0.0	65	11.3
Vallejo	18	21	16	13.0	40	14	0	.014	0.0	52	10.2
Fairfield	14	17	16	—	—	—	—	—	—	—	—
Crockett	—	—	—	—	—	—	—	.026	0.0	—	—
Martinez	—	—	—	—	—	—	—	.020	0.0	—	—

*Number of days ambient air quality standard was exceeded. (Federal oxidant standard >8 ppm.)

** For comparison, average number of days oxidant was exceeded in 1970-1974 mean.

* Percent of observed days when State air quality standard was exceeded.

: Percent of observed days when State air quality standard (100 $\mu\text{g}/\text{m}^3$ for 24 hours) was exceeded.

Source: Air Pollution and the San Francisco Bay Area,
Bay Area Air Pollution Control District, June 1977

TABLE 3-8

OPERATING ENERGY EFFICIENCY FOR TRANSIT AND AUTOMOBILE

<u>Vehicle</u>	<u>Weight</u>	<u>Seats</u>	<u>BTU/WM^(c)</u>	<u>BTU/SM^(d)</u>	<u>BTU/PM^(b)</u>	<u>Assumptions</u>
Fixed Route Bus	20,000	50	37,750	755	3,020	3.6 MPG
Express Bus	20,000	50	29,600	592	2,368	4.8 MPG
Demand Responsive Bus	(a)	19	(a)	1,703	6,812	3.2 MPG
Jitney	8,000	8	17,040	2,130	8,520	8 MPG
Rail Rapid Transit	58,000	72	58,500	812	3,248	Projected, BART
Gas Auto (small)	2,000	4	4,750	1,187	4,748	
Gas Auto (large)	4,000	5	9,500	1,900	7,600	

(a) Not available
 (b) Assumes a 25% load factor. (BTU's per passenger mile).
 (c) British Thermal Units per vehicle mile
 (d) BTU's per seat mile

Source: "Energy Use of Public Transit Systems" by Timothy J. Healy, Ph. D., August 1, 1974.

TABLE 3-9

DISTRIBUTION OF GOLDEN GATE BRIDGE USERS BY COUNTY OF VEHICLE REGISTRATION

<u>Commute Period</u> <u>7-9AM</u>	<u>Marin</u>	<u>Sonoma</u>	<u>San Francisco</u>	<u>San Mateo</u>	<u>Other California</u>	<u>Out of State</u>
January 1979	63%	6%	11%	3%	11%	6%
April 1979	67%	6%	13%	3%	6%	5%
July 1979	55%	8%	12%	5%	14%	6%
October 1979	62%	6%	14%	3%	11%	4%
 <u>All Day & Night*</u>						
January 1979	38%	8%	20%	7%	18%	9%
April 1979	41%	8%	19%	9%	16%	7%
July 1979	34%	8%	20%	10%	21%	7%
October 1979	38%	8%	19%	10%	17%	8%

* 7 day week

Source: GGBHTD License Plate Surveys
 County of Registration from California Department of Motor Vehicles

TABLE 3-10

GOLDEN GATE BRIDGE TRAFFIC - FISCAL YEAR 1971-72 — 1979-80TRANSBAY SOUTHBOUND 6-10 AM WEEKDAYS
(DAILY AVERAGE)

<u>Fiscal Year</u>	<u>Vehicle Traffic</u> ¹	<u>Increase (Decrease)</u>	
		<u>From Prev. Year</u>	<u>From FY 1971/72</u>
1971-1972	19,985	-	-
1972-1973	19,911	(0.4)	(0.4)
1973-1974	19,199	(3.6)	(4.9)
1974-1975	19,485	1.5	(2.5)
1975-1976	19,804*	1.6	(9.0)
1976-1977	20,613	4.1	3.1
1977-1978	21,013	1.9	5.1
1978-1979	20,634	(1.8)	3.2
1979-1980	20,113	(2.5)	.6
1980-1981	21,018**	4.5	5.2

¹ Private vehicles only, does not include trailers, buses & other District vehicles

*Adjusted for bus strike (including strike, the average equals 20,397)

** Average of September, October counts

Source: Monthly Statistical Summary, Average Daily & Hourly Traffic Volumes,
 Golden Gate Bridge Traffic - Southbound, FY 1971-72 through 1978-79.
 FY 1979-80 from twice monthly Southbound counts at the Bridge.

TABLE 3-11

DISTRICT TRANSIT PATRONAGE

(Thousands of Riders)

<u>FISCAL YEAR</u>	<u>GGT</u>	<u>BUS</u>		<u>GG</u>	
	<u>BASIC</u>	<u>LOCAL</u>	<u>COMMUTE</u>	<u>FERRY</u>	<u>TOTAL</u>
1973-74	2,849	1,748	3,737	1,061	9,395
1974-75	3,411	1,649	3,593	1,087	9,740
1975-76 ¹	2,834	1,589	3,467	1,104	8,994
1976-77 ²	3,715	1,711	3,864	1,709	10,999
1977-78	3,844	1,859	3,766	2,141	11,610
1978-79	4,020	1,724	3,927	2,060	11,731
1979-80	4,397	1,788	4,236	1,117 ³	11,538
1980-81 ⁴	4,837	1,967	4,660	2,057	13,520

Notes: 1 = Bus Transit Strike (4-12-76 through 6-14-76)
 2 = Larkspur Ferry Service Started 12-11-77
 3 = Ferry Strike (7-6-79 through 10-21-79)
 4 = Projection for FY 80/81

Source: Bus Transit Deficit Reports & Ferry Patronage Counts, GGBHTD

Definition of Services:

Basic - Buses operating all day, seven days a week, on transbay routes to San Francisco Civic Center and buses operating on weekend recreational routes to West Marin.

Local - Buses operating entirely within Marin County under contract with Marin County Transit District.

Commuter - Direct Service to and from San Francisco CBD and Civic Center during commute hours only.

TABLE 3-12

PERSON TRIPS BY MODE - FISCAL YEARS 1975-76 THROUGH 1979-80 TRANSBAY SOUTHBOUND 6-10M

(DAILY AVERAGE)

MODE	1975-76	1976-77	1977-78	1978-79	1979-80	1975-76	1976-77	1977-78	1978-79	1979-80	PERCENT OF ALL PERSON TRIPS
<u>Highway</u>											
Private auto	22909	23271	23445	23052	22729	62.8	60.7	59.5	58.2	56.7	
- 1 & 2 occupants	3642	4648	5211	5059	10.0	12.1	13.4	13.2	12.6		
- 3 +(carpool or vanpool)											
Bus											
- 66 Transit	8724	8206	8528	8642	9533	23.9	21.4	21.6	21.8	23.8	
- Club Bus	514	524	563	763	765	1.4	1.3	1.4	1.9	1.9	
- Other	NA	NA	NA	235	289	NA	NA	NA	NA	NA	.7
Water											
Ferry	0	1012	963	1101	942	0	2.6	2.4	2.8	2.3	
- Larkspur	248	190	154	145	280	.7	.5	.4	.4	.7	
- Sausalito	423*	465*	489	464	507	1.2	1.2	1.2	1.2	1.3	
- Tiburon											
Transit Total	9909	10397	10697	11350	12316	27.2	27.1	27.1	28.7	30.7	
- Transit plus											
carpools & vanpools	13551	15045	15902	16561	17375	37.2	39.2	40.5	41.8	43.3	
TOTAL	36460	38316	39427	39613	40104	100.0	100.0	100.0	100.0	100.0	

* Estimated

Sources: FY 1977-78 to present from twice-monthly 6-10M Southbound person trip count of the bridge.
 Other automobile person trips from twice-monthly Southbound counts. Other bus person trips from bus occupancy counts, ferry person trips
 from bus occupancy counts. All data are for periods of normal operations; data from strike periods are excluded. Data for 1976-77 are based on the
 first three ferries were in full operation.

TABLE 3-13

TRANSIT SERVICE AND USAGE BY COUNTY FY 75/76 THROUGH 79/80
TRANSBAY SOUTHERN BAY 6-10AM WEEKDAYS

	FROM MARIN						FROM SONOMA						TOTAL (BOTH COUNTIES)							
	75/76	76/77	77/78	78/79	79/80	75/76	76/77	77/78	78/79	79/80	75/76	76/77	77/78	78/79	79/80	75/76	76/77	77/78	78/79	79/80
Transbay Person Trips																				
All Modes	25515	26109	26590	26493	26224	3484	4276	4502	4326	4356	2899C	30385	31092	30819	30560					
Transit	8257	8376	8777	9422	10330	1032	2485	2643	2459	2445	10839	11061	11420	11881	12795					
Number of Transit Trips																				
Bus	189	185	185	185	209	42	44	45	45	45	231	229	230	230	254					
-GG Transit	10	8	7	7	8	8	8	8	13	14	11	18	16	20	21	19				
-Club Bus	NA	NA	9	10	NA	NA	NA	0	0	NA	NA	NA	9	10	11*					
-Other																				
Ferry	0	5	4	4	4	0	0	0	0	0	0	0	5	4	4	4				
-Larkspur	2	2	2	2	2	0	0	0	0	0	0	0	2	2	2	2				
-Sausalito	3	3	3	3	3	0	0	0	0	0	0	0	3	3	3	3				
-Tiburon																				
Number of Seats																				
Bus	8489	8309	8313	8313	9385	1890	1980	2025	2025	2025	10379	10289	10338	10338	11410					
-GG Transit	406	338	280	308	346	330	335	520	616	481	736	673	800	924	827					
-Club Bus	NA	NA	270	350	NA	NA	NA	0	0	NA	NA	NA	270	350	353*					
-Other																				
Ferry	0	2545	2036	2036	2036	0	0	0	0	0	0	0	0	0	0	2545	2036	2036	2036	2036
-Larkspur	792	792	792	792	792	0	0	0	0	0	0	0	792	792	792	792	792	792	792	792
-Sausalito	1430	1430	1430	1430	1430	0	0	0	0	0	0	0	1430	1430	1430	1430	1430	1430	1430	1430
-Tiburon																				

* = Daily Averages

All data are for periods of normal operations; data from strike periods are not included. Data for FY 76-77 are based on the period after the three ferries were in full operation.

Sources: Person trips from monthly counts of persons crossing the bridge and from daily Ferry Logs. Breakdown by county of residence from BART Reports and License Plate Surveys. Number of Golden Gate Transit trips for schedules. Seats per trip from BART and Ferry operating personnel. Tiburon ferry trips and seats per trip from Harbor Carriers. Club bus trips and seats

NA

TABLE 3-14

CHARACTERISTICS OF SINGLE OCCUPANT AUTOMOBILE COMMUTERS ON THE GOLDEN GATE BRIDGE

Demographic Characteristics of Drivers		Commute Live In		
Age	Drivers	Community	Drivers	
18 - 24	4%	San Rafael	21%	
25 - 34	21%	Mill Valley	19%	
35 - 44	32%	Novato	11%	
45 - 54	22%	Sausalito	3%	
55 - 64	13%	Tiburon	3%	
65 and over	2%	San Anselmo	5%	
Income		Corte Madera	5%	
Under \$15,000	7%	Greenbrae	3%	
\$15,000 - \$24,000	16%	Kentfield	3%	
\$25,000 - \$35,000	22%	Fairfax	3%	
Over \$35,000	46%	Larkspur	2%	
Male	67%	Marinwood	2%	
Female	33%	Lucas Valley	2%	
Major Occupational Categories of Drivers		Ross	1%	
Job Title/Position		Car Ownership or Lease		
Job Title, Position	Drivers	All Drivers	(Base)	Own or Company Provides Car
Salesman	10%	All Drivers	(500)	95%
Doctor, Psychologist	7%			5
Teacher, Instructor	6%			
Manager	6%			
Craftsman	5%			
Officer	5%			
Owner, Proprietor	5%			
Administrator, Director	4%			
Engineer	4%			
Secretary, Receptionist	4%			
Supervisor, Foreman	4%			
Clerical	3%			
Consultant	3%			
Nurse	3%			
Entertainment, Arts	3%			
Account Executive	1%			
Analyst	1%			
Lawyer	2%			
Personnel	2%			
Programmer	*			
Accountant	2%			
Car Use				
		Need for job	(250)	93%
		Do not	(213)	98%
Age				
		Under 35	(122)	97%
		35 - 44	(162)	96%
		45+	(215)	95%
Income				
		Under \$35,000(225)		98%
		\$35,000 or over	(231)	94%
Sex				
		Male	(334)	94%
		Female	(166)	99%

Source - ADF Research Single Occupancy Driver and Ferry Rider Attitudinal Survey
April, 1980

* Less than 1/2 of one percent - based on sample of 500 auto drivers

nim

TABLE 3-15

AGE AND SEX OF FERRY PASSENGERS

		SAUSALITO				LARKSPUR			
Age	Sample Size	Weekday		Weekend		Weekday		Weekend	
		AM Commute	PM Commute	Non Commute	Weekend	AM Commute	PM Commute	Non Commute	Weekend
14 or under	-	1.3	2.1	2.0	-	1.7	3.0	7.1	6.9
15 - 19	-	4.5	6.3	5.9	-	3.5	4.8	7.4	8.3
20 - 24	8.9	14.7	11.3	16.6	-	8.0	11.9	8.0	11.5
25 - 44	64.3	58.3	48.3	50.5	-	56.3	50.1	38.4	42.2
45 - 59	17.9	16.7	18.7	17.9	-	25.1	24.1	18.2	18.7
60 - 64	7.1	3.8	5.3	3.9	-	3.1	1.7	6.1	4.9
65 or over	1.8	0.6	7.9	3.2	-	2.3	4.3	14.9	7.5
TOTAL	100.0	99.9	99.9	100.0	-	100.0	99.9	100.1	100.0
Sample Size	56	156	945	1066	-	1062	461	1629	1528
Sex									
Male	69.1	56.2	43.0	46.3	-	66.3	60.5	42.1	43.5
Female	30.9	43.8	57.0	53.7	-	33.7	39.5	57.9	56.5
TOTAL	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0
Sample Size	55	153	924	1019	-	1050	458	1620	1494

INCOME AND AUTO OWNERSHIP OF FERRY PASSENGERS

TABLE 3-13 (continued)

		SAUSALITO				LARKSPUR			
Number of Autos in Household	AM Commute	PM Commute	Weekday		AM Commute	PM Commute	Weekday		
			Non Commute	Weekend			Non Commute	Commute	
None	16.1	9.7	10.8	11.2	2.5	4.6	6.7	12.9	
One	46.4	39.0	38.5	31.8	38.5	39.0	33.6	30.3	
Two	30.4	39.0	34.6	36.8	45.0	43.6	42.3	38.9	
Three or more	7.1	12.3	16.1	20.2	14.1	12.8	17.4	17.9	
TOTAL	100.0	100.0	100.0	100.0	100.1	100.0	100.0	100.0	100.0
Sample Size	56	154	934	1058	1060	461	1605	1495	
Annual Household Income									
Less than \$4,000	1.9	5.5	6.0	6.8	1.7	6.2	5.4	7.9	
\$4,000 to \$9,999	7.7	8.3	12.2	13.9	6.9	9.6	11.9	11.8	
\$10,000 to \$14,999	15.4	20.7	15.4	13.9	10.1	12.7	13.8	15.6	
\$15,000 to \$19,999	9.6	10.3	17.4	13.1	12.3	10.8	13.8	15.4	
\$20,000 to \$24,999	9.6	13.1	14.1	16.1	15.1	14.6	15.8	15.4	
\$25,000 to \$31,999	25.0	17.2	14.9	14.7	26.5	25.2	18.9	15.8	
\$35,000 to \$49,999	17.3	14.5	12.2	10.4	17.3	11.5	10.4	10.9	
\$50,000 or more	13.5	10.3	7.9	11.2	10.0	9.4	10.0	7.1	
TOTAL	100.0	99.9	100.1	100.1	99.9	100.0	100.0	99.9	99.9
Sample Size	52	145	781	902	977	417	1264	1192	

Source: GGBHTD, 1977 Ferry Passenger Survey, Office of Planning & Policy Analysis

n/a

TABLE 3-16

SOCIO-ECONOMIC COMPARISON OF BUS PATRONS
BY TRIP TYPE

Age	Sonoma Local	Marin Local	Sonoma/Marin		Marin/S.F.
			Sonoma	Marin	
14 or under	2.8	20.3	9.3	1.3	1.6
15 - 19	36.5	34.1	24.6	4.1	5.6
20 - 24	17.4	14.2	21.2	8.7	12.3
25 - 44	28.7	19.0	33.9	49.5	49.6
45 - 59	7.8	5.5	6.8	28.2	22.2
60 - 64	2.1	1.3	1.7	5.4	4.0
65 or over	4.6	5.6	2.5	3.8	4.7
TOTAL	99.9	100.0	100.0	100.0	100.0
Sample Size	282	2381	118	390	2520
<hr/>					
Income					
Less than \$4,000	24.8	19.7	23.1	4.6	6.8
\$4,000 to \$9,999	28.1	21.4	13.2	11.1	12.7
\$10,000 to \$14,999	10.3	15.1	12.1	17.6	14.1
\$15,000 to \$19,999	12.8	10.7	12.1	21.2	12.3
\$20,000 to \$24,999	7.9	10.5	11.0	14.3	13.2
\$25,000 to \$34,999	6.6	9.3	15.4	20.5	20.0
\$35,000 to \$49,999	5.8	5.4	8.8	8.1	13.7
\$50,000 or more	3.7	7.9	4.4	2.6	7.3
TOTAL	100.0	100.0	100.1	100.0	100.1
Sample Size	242	1486	91	307	2265

	<u>Sonoma Local</u>	<u>Marin Local</u>	<u>Sonoma/Marin</u>	<u>Sonoma/S.F.</u>	<u>Marin/S.F.</u>
<u>Sex</u>					
Male	42.2	36.5	52.9	67.3	56.9
Female	57.8	63.5	47.1	32.7	43.1
TOTAL	100.0	100.0	100.0	100.0	100.0
<u>Sample Size</u>	289	2341	119	388	2531
<u>Auto Ownership</u>					
None	24.1	24.0	19.6	11.9	17.7
One	34.5	30.1	33.0	38.1	39.8
Two	27.0	32.6	28.6	36.2	32.7
Three or more	14.4	13.2	18.8	13.8	9.7
TOTAL	100.0	99.9	100.0	100.0	99.9
<u>Sample Size</u>	278	2296	112	362	2514
<u>Passenger Type</u>					
Student, age 6 - 21	46.7	58.1	37.8	7.1	8.4
Senior, age 65+	4.0	5.6	4.5	4.5	5.1
Handicapped Person	3.6	3.0	0.9	1.1	1.2
All others	45.7	33.2	56.8	87.3	85.3
TOTAL	100.0	99.9	100.0	100.0	100.0
<u>Sample Size</u>	276	2379	111	354	2490
<u>Possession of Transit Discount Card</u>					
Yes	6.8	4.2	4.0	0.9	2.5
No	93.2	95.8		99.1	97.5
TOTAL	100.0	100.0	100.0	100.0	100.0
<u>Sample Size</u>	249	2114	99	334	2317

FIVE-YEAR FINANCIAL POSITION STATEMENT 1980/81 - 1985/86

Table 3.17

	1980/81	1981/82	1982/83	1983/84	1984/85
Operating Resources					
Available Resources					
Available for Economic Operations	\$ 15,015,196	\$ 15,191,216	\$ 15,615,716	\$ 15,895,156	\$ 15,261,556
Reserve for Banking Capital	1,557,030	0	0	0	0
Reserve for Discretionary Capital	3,400,000	0	0	0	0
Reserve for Other Capital	16,161,000	16,390,500	17,120,000	17,291,200	17,464,400
Total Revenue	14,212,200	15,320,000	15,320,000	15,200,000	14,200,000
Interest Revenue	1,556,819	1,566,819	1,566,819	1,566,819	1,579,489
Dividend Income	1,109,000	1,109,000	1,109,000	1,109,000	1,101,800
Capital Requirements	(16,161,000)	(16,390,500)	(16,390,500)	(16,390,500)	(16,390,500)
Reserve Requirements	(1,557,030)	(1,557,030)	(1,557,030)	(1,557,030)	(1,557,030)
Bridge Division Subplan	5,254,736	5,254,736	5,254,736	5,254,736	5,254,736
Res Division					
Interest Revenue	\$ 10,966,598	\$ 11,960,566	\$ 12,954,947	\$ 13,950,697	\$ 14,954,206
Interest Expense	(20,861,861)	(21,863,540)	(25,946,400)	(34,164,600)	(44,460,000)
Operating Expenses	(1,136,383)	(1,136,383)	(1,136,383)	(1,136,383)	(1,136,383)
Capital Requirements	(661,000)	(655,000)	(649,000)	(649,000)	(649,000)
Reserve Requirements	(119,000)	(119,000)	(119,000)	(119,000)	(119,000)
Subsidiary Loan	1,500,000	1,609,302	1,718,316	1,827,316	1,936,211
Bridge Division (Subplan)	5 (1,597,513)	5 (6,355,635)	5 (12,200,528)	5 (18,665,499)	5 (26,205,452)
Forty Division					
Interest Revenue	\$ 1,250,000	\$ 1,397,000	\$ 1,560,500	\$ 1,739,500	\$ 1,916,500
Interest Expense	(6,136,383)	(6,363,540)	(7,521,373)	(9,594,182)	(11,636,816)
Operating Expenses	(1,136,383)	(1,136,383)	(1,136,383)	(1,136,383)	(1,136,383)
Capital Requirements	(661,000)	(655,000)	(649,000)	(649,000)	(649,000)
Reserve Requirements	(119,000)	(119,000)	(119,000)	(119,000)	(119,000)
Subsidiary Loan	1,500,000	1,609,302	1,718,316	1,827,316	1,936,211
Forty Division (Subplan)	5 (1,594,933)	5 (6,359,593)	5 (12,206,535)	5 (18,665,593)	5 (26,206,535)
Marketing Division					
Interest Revenue	\$ 1,250,000	\$ 1,397,000	\$ 1,560,500	\$ 1,739,500	\$ 1,916,500
Operating Expenses	(1,136,383)	(1,136,383)	(1,136,383)	(1,136,383)	(1,136,383)
Capital Requirements	(661,000)	0	0	0	0
Reserve Requirements	(119,000)	0	0	0	0
Subsidiary Division (Subplan)	5 (1,594,933)	5 (6,359,593)	5 (12,206,535)	5 (18,665,593)	5 (26,206,535)
Marketing Adjustment 1980/81	\$ 1,536,260				
Total Discretionary Capital	\$ 15,460,260	\$ 16,097,566	\$ 16,390,566	\$ 16,899,766	\$ 16,461,360
Available Resource Expended 1980/81					
Available Resource Expended 1980/81	\$ 15,536,260	\$ 16,107,566	\$ 16,407,566	\$ 16,909,766	\$ 16,461,360
Interest to be Expended	\$ 1,500,000	0	0	0	0
Bridge Division Capital Expenditure	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Bridge Adjustment 1980/81	\$ 1,536,260				
Total Discretionary Capital	\$ 15,460,260	\$ 16,097,566	\$ 16,390,566	\$ 16,899,766	\$ 16,461,360
Available Resource Expended 1981/82					
Available Resource Expended 1981/82	\$ 15,536,260	\$ 16,107,566	\$ 16,407,566	\$ 16,909,766	\$ 16,461,360
Interest to be Expended	\$ 1,500,000	0	0	0	0
Bridge Adjustment 1981/82	\$ 1,536,260				
Available Resource Expended 1982/83					
Available Resource Expended 1982/83	\$ 15,536,260	\$ 16,107,566	\$ 16,407,566	\$ 16,909,766	\$ 16,461,360
Interest to be Expended	\$ 1,500,000	0	0	0	0
Bridge Adjustment 1982/83	\$ 1,536,260				
Available Resource Expended 1983/84					
Available Resource Expended 1983/84	\$ 15,536,260	\$ 16,107,566	\$ 16,407,566	\$ 16,909,766	\$ 16,461,360
Interest to be Expended	\$ 1,500,000	0	0	0	0
Bridge Adjustment 1983/84	\$ 1,536,260				
Available Resource Expended 1984/85					
Available Resource Expended 1984/85	\$ 15,536,260	\$ 16,107,566	\$ 16,407,566	\$ 16,909,766	\$ 16,461,360
Interest to be Expended	\$ 1,500,000	0	0	0	0
Bridge Adjustment 1984/85	\$ 1,536,260				

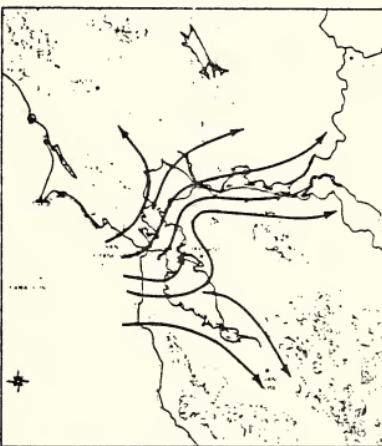
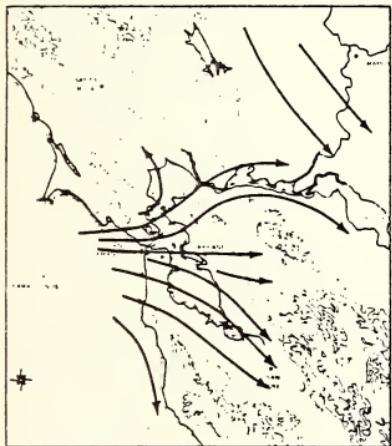
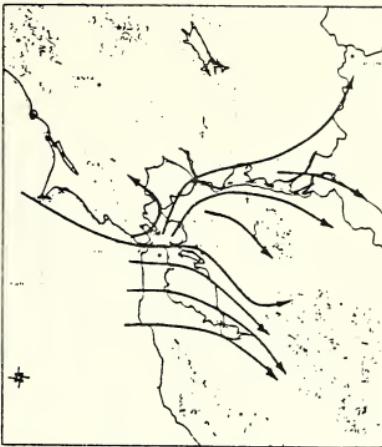
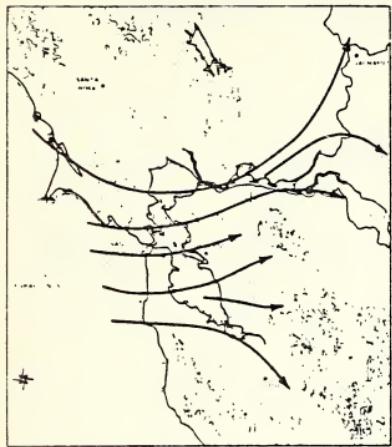


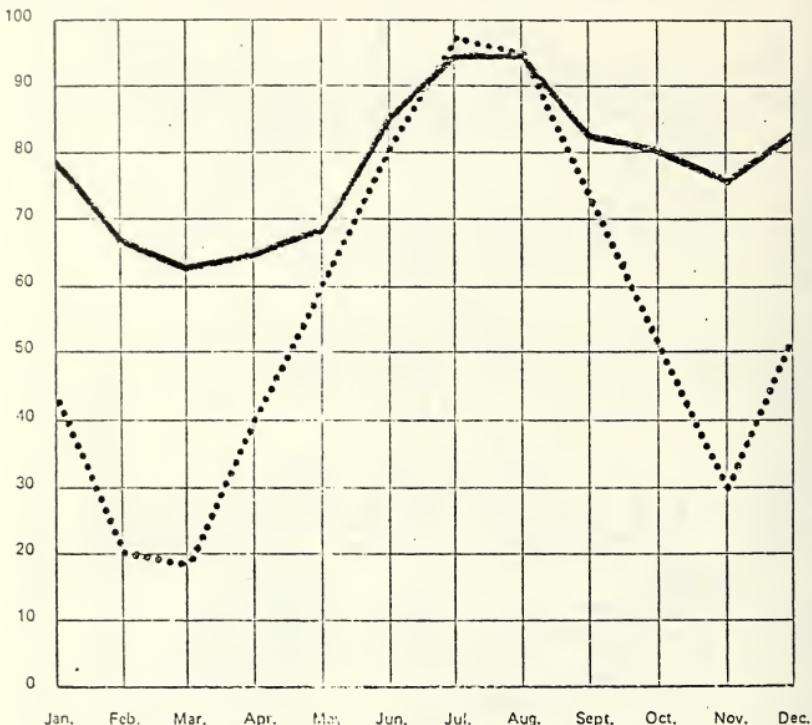
FIGURE 3-1. MOST COMMON DAYTIME AIRFLOW PATTERNS IN THE SAN FRANCISCO BAY AREA

SOURCE: Reference 7, page IV. B. 1(B)-2.

FIGURE 3-2

FREQUENCY OF INVERSIONS, 1957-1967

per cent



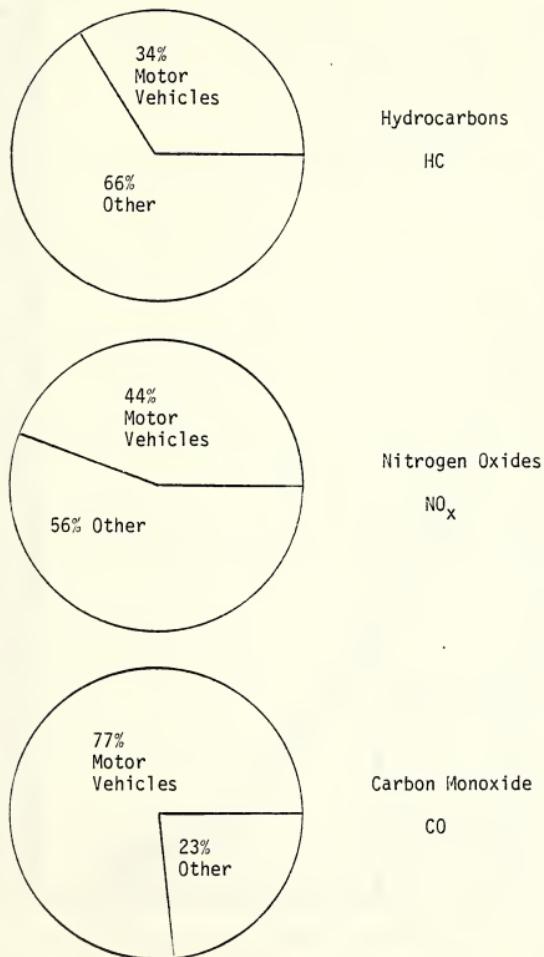
0400 PST

1600 PST

—percent: Frequency of inversions, based on 2500 feet or less by month, based on Oakland rain gauge data for the period 1957-1967

SOURCE: Reference 4

Figure 3.3
Percent of Air Pollution Caused by Motor Vehicles
San Francisco Bay Area, 1980



Source: Bay Area Air Quality Management District Projections

Figure 3.4

Figure 3.4
MARN COUNTY ENERGY USE
1978

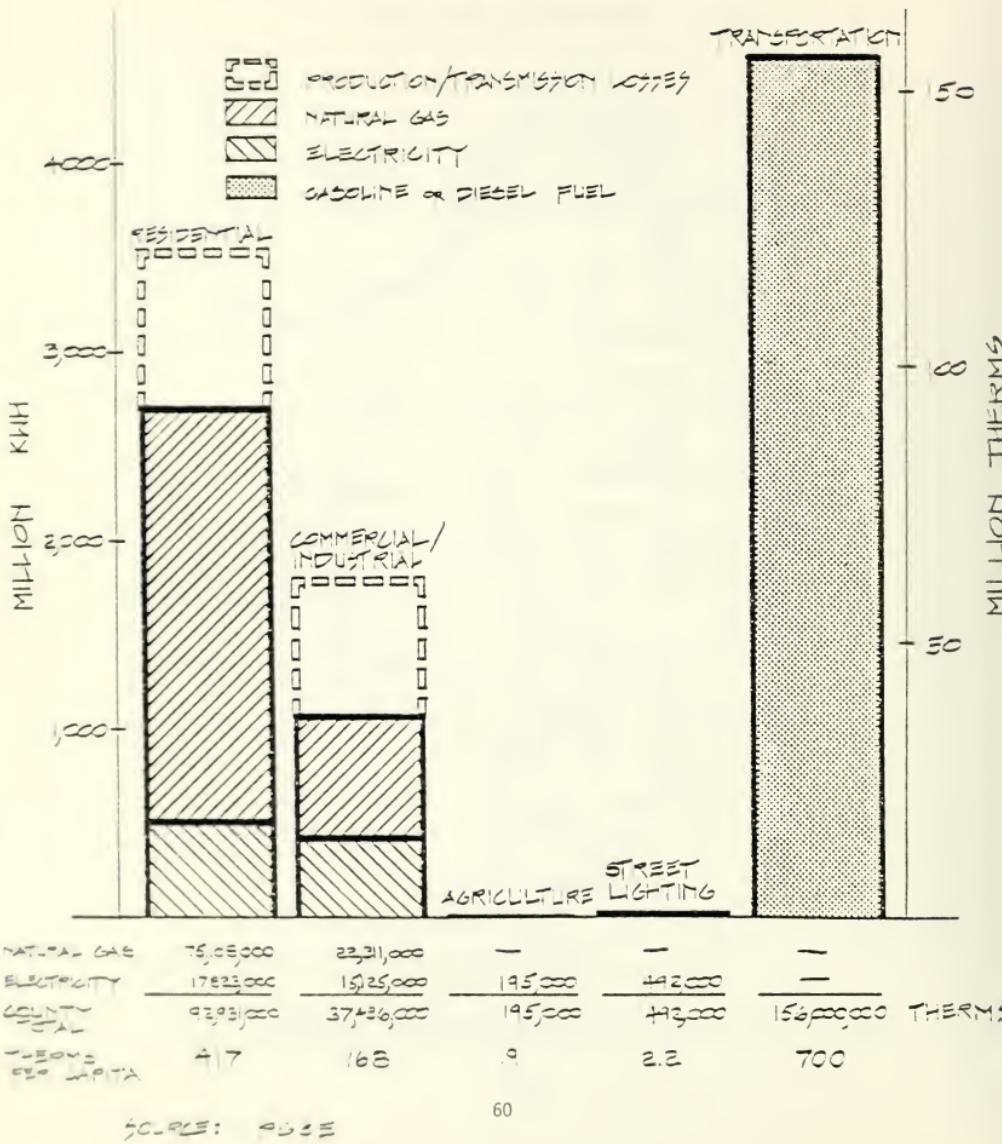


Figure 3-5

Golden Gate Bridge Traffic

(1937 to present)

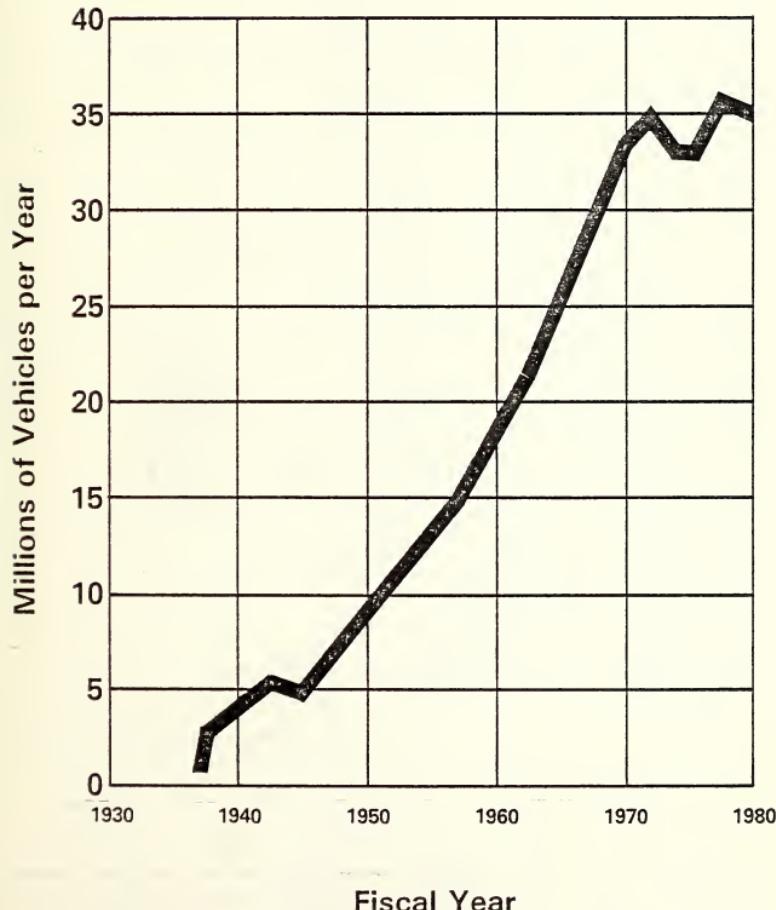
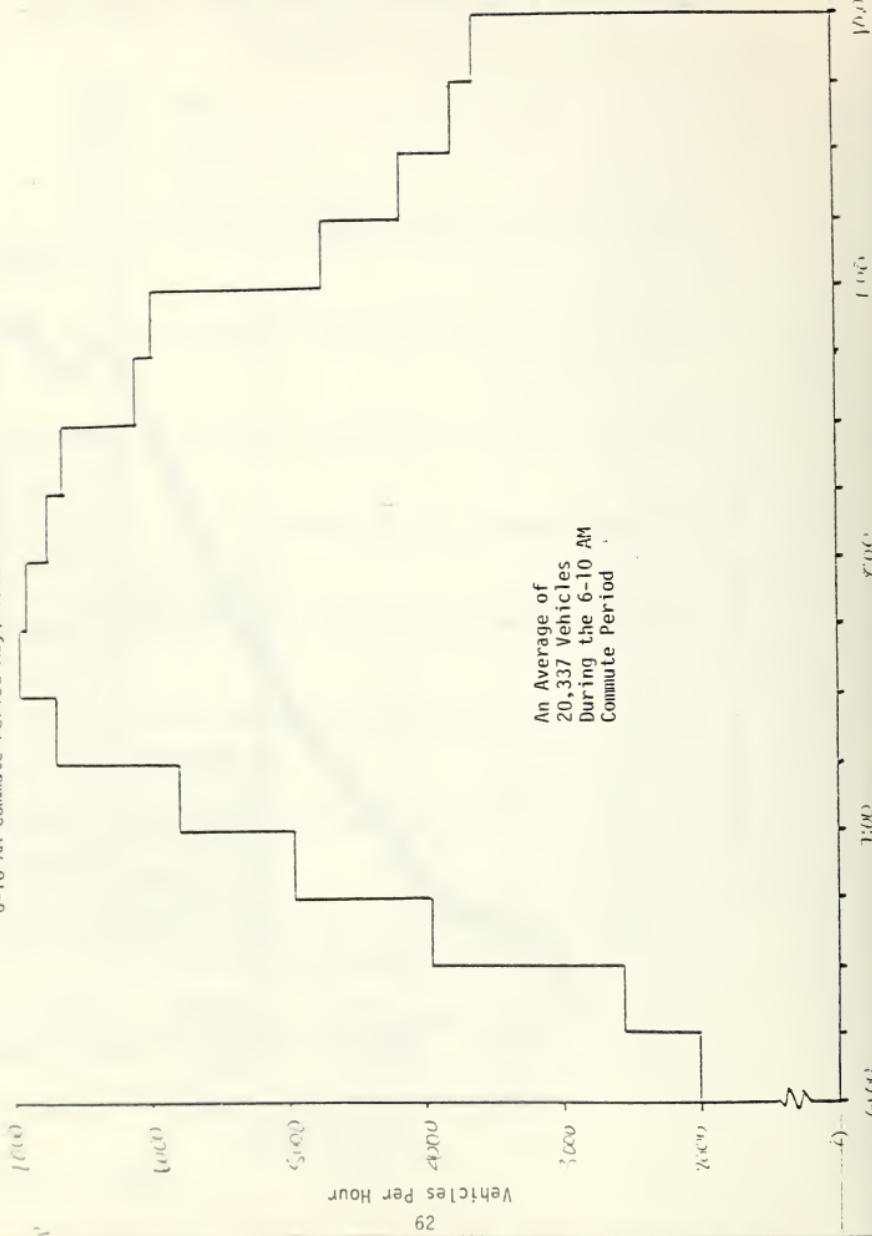


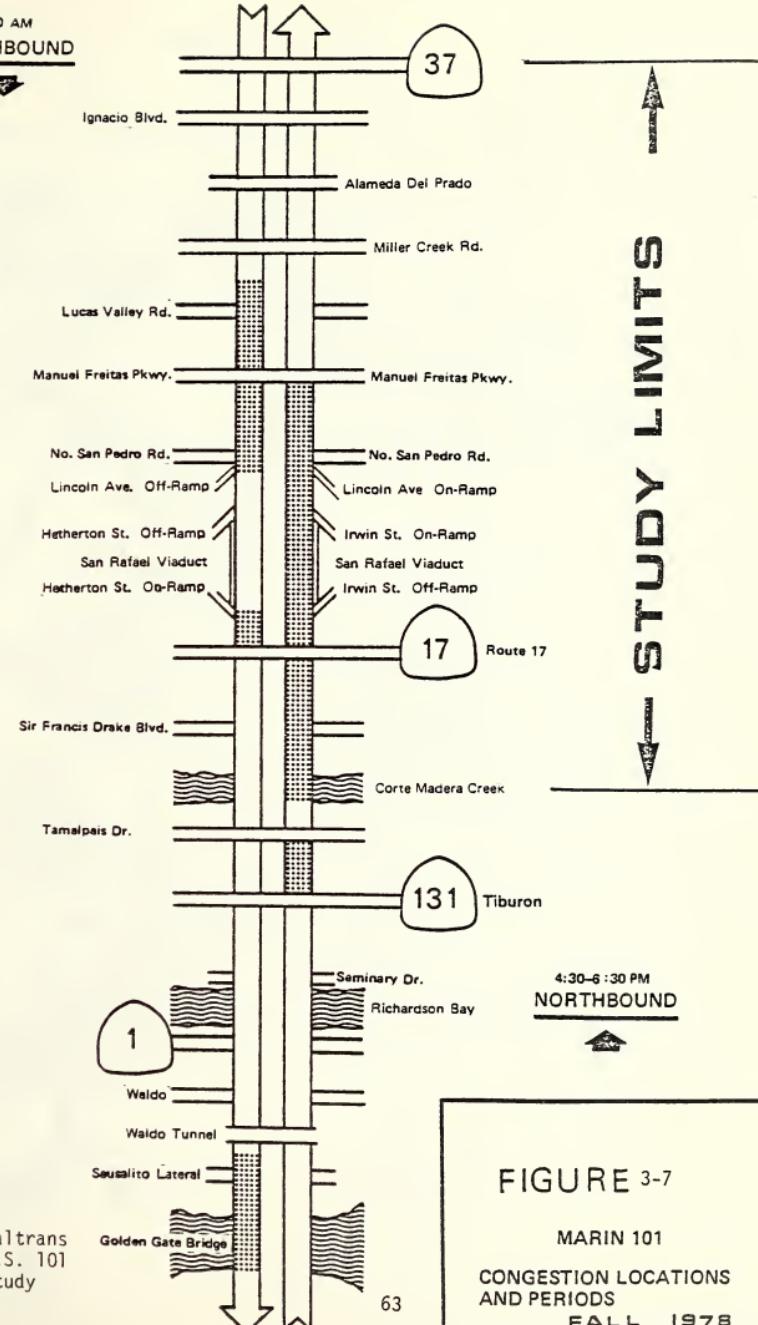
Figure 3.6

Golden Gate Bridge Southbound Traffic Volume in 15 Minute Intervals

6-10 AM Commute Period May, 1980



7:30 AM
SOUTHBOUND



Source: Caltrans
U.S. 101
Study

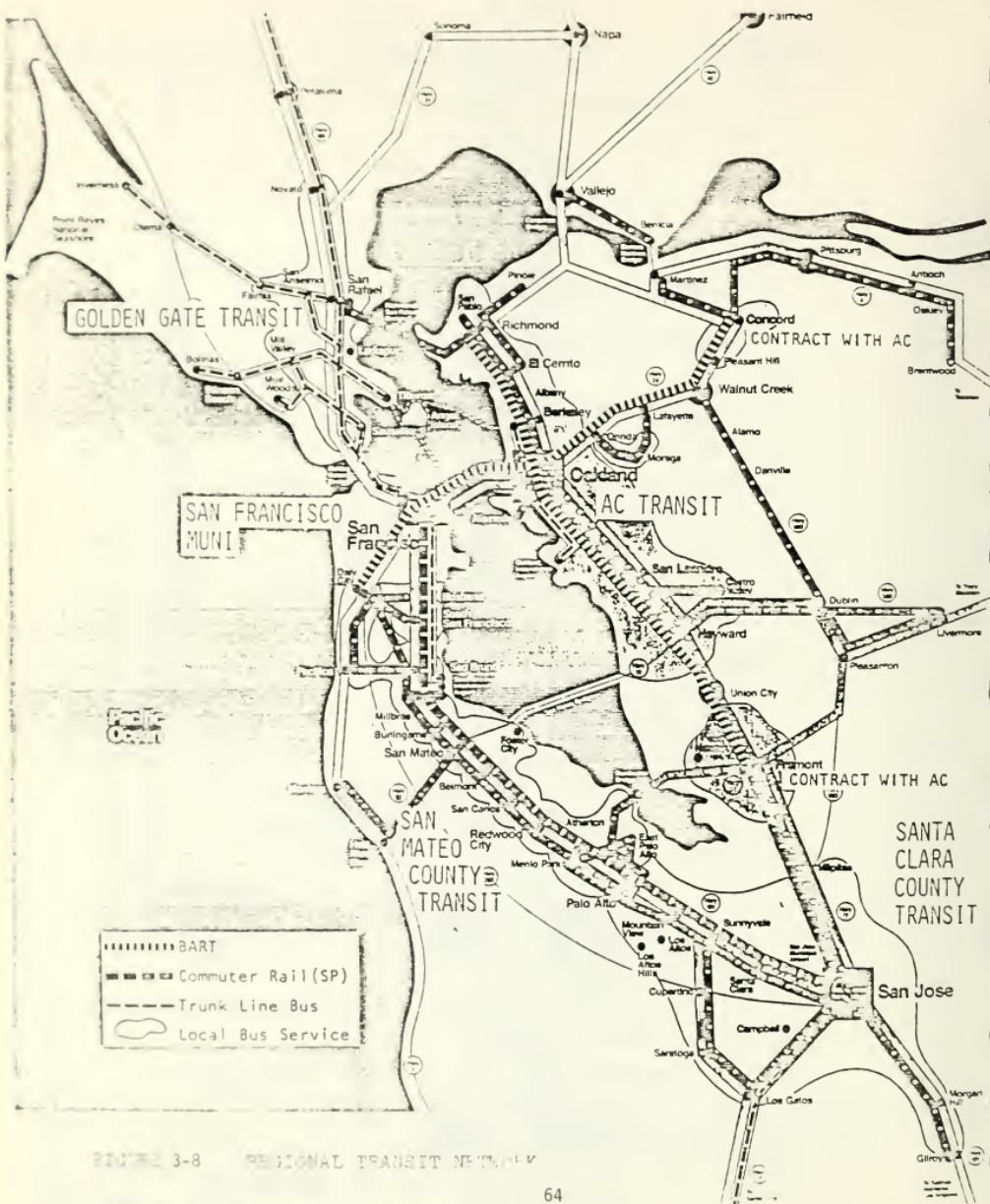


FIGURE 3-8 REGIONAL TRANSIT NETWORK

4.0 ASSESSMENT OF ENVIRONMENTAL EFFECTS

This analysis assesses the economic and environmental effects of implementing any of the proposed "prime focus" toll increase alternatives by comparing conditions as they would be after the proposed increase with the conditions which would prevail if there were no toll increase. The comparison assumes that, in each case, the District's various facilities and services would continue to operate as planned. As with previous analyses of this type (Ref. 4), it is necessary to note that because the District's current revenues will not continue to support its present levels of service, a continuation of the present tolls and services is an "alternative" only if it is assumed to be accompanied by some other increases in revenue or reductions in expenditure. The feasibility and desirability of effecting such changes to revenues or expenditures as alternatives to the proposed action is discussed in Chapter 5. The toll increase alternatives are described in section 2.4 and summarized in Table 2-3.

4.1 Traffic and Transportation

Any of the toll increase alternatives A, B, C, or D would affect traffic and transportation patterns by causing a diversion of commute period traffic from single occupant autos to multiple occupant autos and to public transportation. This diversion would be caused by persons who need to travel southbound between the affected periods 6 through 9 a.m. and 4 through 6 p.m. at the Golden Gate Bridge and who would choose to make the change to avoid the higher tolls for single occupant vehicles. It is believed that the majority of persons able to make this adjustment would be regular commuters. The majority of persons switching to ride-sharing or transit during the 6-9 a.m. period southbound would return northbound generally during the evening commute period and, having no personal car available, would travel by ride-sharing or transit for this return trip. Likewise, persons making the switch during the 4-6 p.m. period would have traveled northbound by ride-sharing or transit generally during the morning commute period.

The estimated changes to traffic volumes crossing the Golden Gate Bridge southbound during the weekday traffic peaks 7-9 a.m. and 4-6 p.m. are shown in Table 4 - 1. The estimate was made using "price elasticities" derived from previous experience with changes to Golden Gate Bridge tolls and Golden Gate Transit fares. The total peak period traffic change shows the reduction in the number of vehicles in both the northbound and southbound traffic flows during both the morning and evening peaks.

It is estimated that the average number of travelers changing from auto to transit during the 7-9 a.m. weekday peaks in FY 1980/81

as a result of the proposed toll increase alternatives would be approximately 180 for Alternative A and 370 for Alternatives B, C, and D.

In addition, it is expected that any of the four prime focus alternatives would result in a diversion of some single occupant vehicles from the affected commuter peak periods (6-9 a.m.; 4-6 p.m.) to earlier or later times. The number of trips so diverted is expected to be too small to be identified in the traffic statistics. Its effect would be to further reduce the number of vehicles crossing the Bridge during the commute peak.

As explained in section 3.5, the most serious traffic congestion in the Golden Gate Corridor is no longer at the Golden Gate Bridge, but at a number of locations on U.S. 101 in central Marin County. About half of the commuter peak traffic at the Golden Gate Bridge originates from points north of this congestion zone. It is expected, therefore, that any of the proposed alternatives would reduce traffic demand on the congested sections of U.S. 101 in amounts approximately half of those shown in Table 1. That is, during the 6:30-8:30 a.m. commute period southbound traffic on U.S. 101 in central Marin would be reduced by 130 vehicles under Alternative A, 270 vehicles under Alternative B, 243 vehicles under Alternative C, and 255 vehicles under Alternative D. Northbound traffic in the evening commute period would be reduced by an equal number of vehicles.

Thus any of the four prime focus alternatives would cause a small but significant relief to commuter traffic congestion on the Golden Gate Bridge and its approaches and on U.S. 101 in central Marin. Driving time between Novato and San Francisco in the commute peak is expected to be reduced by some one or two minutes.

4.2 Energy and Air Quality

As explained in Section 4.1, each of the four prime focus alternatives would result in a reduction in vehicular traffic. This in turn would result in a reduction in fuel consumption and vehicular emissions. The estimated reduction in vehicle miles traveled, vehicular fuel consumed, and vehicular emissions generated for each of the four prime focus alternatives is shown in Table 4 - 2. The estimates of vehicle miles traveled were based on the traffic impact estimates, Section 4.1, and assumptions of average trip length for corridor travel used in the District's previous planning studies. The estimates of fuel consumption and emissions were based on the estimated vehicle miles traveled and used the California Air Resources Board's EMFAC computer model. The reductions in fuel consumption and emissions are seen to be in the range four-tenths to eight-tenths of one percent of the fuel consumption and emissions attributable to all vehicular movements within the San Francisco-Marin-Sonoma corridor which cross the Golden Gate Bridge.

As stated in Section 4.1, up to 370 additional peak period transit riders would result from the proposed toll increase. This is an increase of 4 percent of the 9,600 transit riders typically carried during each 7-9AM and 4-6PM peak. It has been assumed that these additional riders would be accommodated without additional bus or ferry operations. There would, therefore, be no increase in fuel consumption or emissions by transit operations.

4.3 Socioeconomic Impacts

4.3.1 Potential for Economic Hardship

Alternative A entails a 50¢ per round-trip increase in travel cost for single occupant motorists crossing the Golden Gate Bridge southbound between 6 and 9 AM or between 4 and 6 PM on weekdays; Alternatives B, C, or D would each entail a \$1.00 increase. For nonregular travelers this non-recurring payment is unlikely to cause hardship. For commuters and other regular travelers, the increased cost can be avoided by those willing and able to share a ride with another person, use transit, or drive at an earlier or later time.

At current average costs for owning and operating an automobile, the one dollar increase in toll would be equivalent to an additional 3 or 4 miles of driving at typically accepted total costs of 25 to 35 cents per miles. At typically accepted out of pocket costs (covering just gasoline, oil, and tires) of 10 cents per mile, the one dollar toll increase would be equivalent to ten additional miles of driving. The round-trip daily journey for commuters to downtown San Francisco varies from about 20 miles for Mill Valley residents to 120 miles for Santa Rosa residents. Table 3-14 shows that single occupant auto commuters are a relatively high income sector of the population, with 46% having household incomes over \$35,000 per year and only 7% having incomes below \$15,000 per year.

For regular commuters, the cumulative effect of the one dollar toll increase would be up to about \$250 per year. Socioeconomic statistics (see Section 3.8) indicate a relatively high income for the majority of Golden Gate Corridor commuters. There will, however, be a small number of commuters with low income who for a variety of reasons must drive alone during the peak periods, and for whom the additional \$250 a year would be perceived as a hardship.

The small but growing number of San Francisco residents now commuting to newly created jobs in Marin County are a possible concern. The statistics on population and employment (Section 3.2) indicate generally lower incomes and higher unemployment rates for San Francisco than for Marin County. Moreover, the jobs in Marin County are believed to be generally lower paid than the San Francisco jobs held by Marin and Sonoma County commuters, and the commute travel pattern to Marin jobs is more physically dispersed making it relatively difficult to provide effective transit or arrange ridesharing from a San Francisco home to a Marin job. Thus, this group, in general, appears to have less opportunity to avoid the increase by switching to transit or ridesharing.

4.3.2 Potential to Disproportionately Impact Racial Minorities, the Elderly, the Handicapped or Transit Dependent Groups.

An examination of the demographic statistics (Section 3.2) and the statistics on transbay travel (Section 3.7) and any other information known to the authors, provides no reason to believe that the proposed commute period toll increase might disproportionately impact any of the subject groups.

4.4 Financial Impacts

As explained in Section 2.3, the principal objective of the proposed toll increase is to raise additional revenues to offset inflation in the cost of operating the District's various facilities and services and permit their continued operation. The financial impact of the proposed toll increase would be to raise additional revenues without incurring additional operating cost and thereby meet the principal objective of the proposal. The amounts of the additional revenue which would be raised by Alternatives A, B, C, and D is shown in Table 4 - 3.

The District's Five Year Financial Projections are shown in Table 3.17 & in Appendix A. It is seen that the effects of inflation create a recurring need to raise tolls and/or fares or make operating economies to bring revenues and expenditures into balance. The manner in which the District has met and is continuing to meet this need is described in Chapter 5.

On November 1, 1977, auto tolls were increased from 75 cents to one dollar and transit fares were increased. The action increased District revenues by approximately five and a half million dollars per year. On September 1, 1979, the District reduced the hours of the free carpool provision from 6-10 a.m. to 6-9 a.m. and increased transit fares. Certain ferry schedules were eliminated to reduce cost. On November 1, 1979, the District began a 25c fare for feeder buses going from the ferry terminals. This raised an additional \$50,000 per year. A number of other administrative and operating economies were also introduced.

The Five Year Financial Projections (Chapter 3.8 and Appendix A) show that, at present tolls and fares and at current levels of transit service, the District will incur a deficit, not fundable from available reserves, of approximately \$900,000 by the end of this fiscal year and a deficit of over \$4 million the ensuing year. Thus, by the end of FY 1981/82, the cumulative deficit would be nearly \$5 million. None of the toll increases A through D will alone meet the District's projected needs for the 18 month period. Even were Alternative B enacted (which generates the largest amount of additional revenue) some further actions to increase revenue or reduce expenditure would be required during FY 1981/82.

4.5 Other Impacts

To the extent that the proposed increase would generate revenues to support public transportation, encourage transit use and ridesharing, reduce traffic congestion, air pollution and energy consumption it is complimentary to regional and local plans. In no respect is it in conflict with these plans.

The proposed toll increase will not affect water quality, noise levels, or the habitat of living things. It will not affect the quality of the human environment in ways other than those discussed in sections 4.1 through 4.4 above. It will not adversely affect the productivity or effectiveness of the local or regional public transportation systems.

The proposed action has been considered, and found to have no potential to effect the environment with respect to the following areas of concern:

Services and Utilities
Construction
Geology and Soils
Water Resources
Topography
Climate
Wildlife and Vegetation
Visual, Aesthetic and Archeological Resources
Mineral, Agricultural and Recreational Resources
Human Health

4.6 Mitigation

The preceeding sections of this chapter show that the principle effects of the proposed action would reduce automobile traffic and, thereby, serve to enhance the environment. These effects do not require mitigation.

Subsection 4.3.1 recognizes that there are probably geographically identifiable groups of commuters who are at present less able to take advantage of transit or ridesharing. The impact of the proposed differential toll on these groups could probably be mitigated by special efforts to improve transit service and ridesharing opportunities to their areas.

TABLE 4 - 1

Traffic Volumes At The Golden Gate BridgeFor Toll Alternatives A, B, C, & D

(Southbound Traffic, Average for Fiscal Year 1980/81)

	Traffic Vol. with Existing Tolls	Change Due to Toll Increase:			
		Alt. A	Alt. B	Alt. C	Alt. D
Weekdays, 7-9 a.m.					
1 occupant	9,200	-410	-740	-920	-830
2 occupants	2,600	+120	+130	+380	+260
<u>3 occupants</u>	<u>900</u>	<u>+ 30</u>	<u>+ 70</u>	<u>+ 50</u>	<u>+ 60</u>
Total 7-9 a.m.	12,700	-260	-540	-490	-510
Weekdays 4-6 p.m.					
1 occupant	3,000	-140	-240	-300	-270
2 occupants	1,150	+ 60	+ 60	+170	+120
<u>3 occupants</u>	<u>700</u>	<u>+ 20</u>	<u>+ 50</u>	<u>+ 40</u>	<u>+ 40</u>
Total 4-6 p.m.	4,850	- 60	-130	- 90	-110
Total Peak Period Traffic Change	NA	-640	-1340	-1160	-1240
Total Traffic For FY 1980/81	35,845,000	-160,000	-340,000	-293,000	-316,000

TABLE 4 - 2

Vehicle Fuel Consumption And EmissionsFor Toll Alternatives A, B, C, & D

(All Northbound and Southbound Transbay Traffic For Fiscal Year 1981/82)

	With Existing Tolls	Change Due To Toll Increase:			
		Alt. A	Alt. B	Alt. C	Alt. D
Millions of Vehicle Miles Per Year	782.0	-3.3	-7.0	-6.1	-6.5
Fuel Consumed (Thousands of Gallons per Yr.)	39,882	-172	-366	-315	-340
Emissions (Tons per Year)					
CO	16,292	- 71	-152	-131	-141
HC	1,412	- 6	-13	- 11	- 12
NO _x	2,208	- 9	-19	- 16	- 18

TABLE 4 - 3

Increase In District Revenues From Alternatives A, B, C, or D

	Financial Year:				
	1980/81 (Jan. thru June)	1981/82	1982/83	1983/84	1984/85
Annual Toll Revenue with Existing Tolls (Millions of Dollars)	8.39	16.95	17.12	17.29	17.46
Increase in Toll Revenues Due To Alternative (Millions of Dollars)					
Alt. A	0.57	1.15	1.16	1.18	1.19
Alt. B	1.32	2.67	2.70	2.74	2.78
Alt. C	0.76	1.55	1.57	1.59	1.61
Alt. D	1.05	2.13	2.16	2.19	2.22

5.0 ALTERNATIVES

The objective of the proposed action is to raise additional revenues which will be needed to continue full operation of the District's transit services while permitting needed maintenance and repair of the Golden Gate Bridge and preserving restricted reserve funds for the purposes to which they are dedicated.

The proposed action consists of implanting one or a combination of the four options described in Chapter 2

Alternatives to the proposed action are:

- (1) Raise the needed revenue in some other manner;
- (2) Avoid or postpone the need for additional revenue.

5.1 Other Means of Increasing Revenues

5.1.1 Alternative Toll Increases for Automobiles

In addition to the Prime Focus Alternatives (Alternatives A, B, C & D) described in Section 2.4, five other toll increase Alternatives have been analyzed. The features of these Alternatives are described below and summarized on Table 5-1.

Alternative E: This alternative would entail an increase in the basic toll, applicable at all times, from \$1.00 to \$1.25 per automobile. The free passage for carpools (vehicles with 3 or more occupants during morning and evening commute periods) would be retained.

Alternative F: This is the same as Alternative E except that the toll would be increased to \$1.50.

Alternative G: This alternative would combine an increase in the basic toll with a differential toll for one occupant vehicles during the peak commute hours and an extension of free passage for carpools. The basic toll would be increased to \$1.25, vehicles with 3 or more occupants would be free all days, and one occupant vehicles would be charged \$1.50 during morning and evening commute periods.

Alternative H: This alternative would combine an increase in the basic toll with an extension of the differential toll for single occupant vehicles and an extension of free passage for carpools. The basic toll would be increased to \$1.25, vehicles with 3 or more occupants would be free all day, and the toll for single-occupant vehicles would be further increased to \$1.50 all day.

Alternative I: This alternative would combine an increase in basic toll with a differential toll for single occupant vehicles and a

lower than basic toll for two occupant vehicles during the commute periods. Free passage for carpools during the morning and evening commute periods would be retained. The basic toll would be increased to \$1.25. During the commute period, the toll for single occupant vehicles would be further increased to \$1.50 and the toll for two occupant vehicles would be \$1.00.

The impacts of these five alternative toll structures, in comparison to the existing toll level, on traffic, revenue generation, fuel consumption and air pollution are shown in Tables 5-2, 5-3 and 5-4. These alternatives may be compared with the four "principal focus" toll options, the impacts of which, relative to the same base, are depicted in Tables 4-1, 4-2, and 4-3.

In general, Alternatives E, F, G, H and I differ from the four prime focus alternatives in that they involve increases to the basic toll applicable during non-commute hours. While a basic toll increase would raise substantial additional revenues, it would have a relatively small effect on traffic volumes, fuel consumption and emissions. This is because travel patterns in the non-commute periods are more diverse and less regular, and proportionately fewer travelers are able to utilize transit or ridesharing.

5.1.2 Increases in Tolls for Vehicles Other Than Automobiles

It is possible that the District could raise additional revenue by increasing the tolls for vehicles other than automobiles (see Table 2-1 for the schedule of tolls). These vehicles, however, generate less than 4% of total toll revenues; thus even a very substantial increase in tolls assessed against them would have only a modest impact in terms of additional revenue.

5.1.3 Ancillary Revenue Sources

Opportunities for secondary revenues, such as commissions from snack bars and royalties on sales of Bridge souvenirs, are exploited as far as possible. The District has recently initiated the rental of advertising space at the Ferry Terminals and will shortly commence an experimental program of leasing advertising space on its buses in order to increase revenues.

In the aggregate, these sources can be expected to produce less than 1% of the District's annual revenue and clearly can have little more than a marginal impact on its revenue needs.

5.1.4 Increasing Transit Fares

The District provides bus service on a number of local routes which lie entirely within Marin County (Defined as Category "A" service) under contract to the Marin County Transit District. Fares on this service are established by the Marin County Transit District. The District also operates transbay basic (Category "B") and special commuter (Category "C") bus service between San Francisco and points in Marin and Sonoma Counties. These routes primarily serve passengers on inter-county journeys, but also carry passengers on trips entirely within Marin or within Sonoma. Fares for all journeys on these routes are established by the District; the fares for trips entirely within Marin or within Sonoma being established in consultation with the counties.

To the extent that fares do not cover the cost of providing local operations (including the portion of the inter-county routes used by local passengers), the deficit is recovered by payments from the counties. Under the contracts now in force, the counties have elected to make the payments by means of a negotiated division of State and Federal subvention funds administered by the Metropolitan Transportation Commission. The present contracts have fixed the levels of county contributions (by means of a cost-allocation formula) through June 1981 for Sonoma County and through June 1983 for Marin County. Thus, the District cannot unilaterally act to increase county participation in the costs of transit operations during the term of these contracts except by raising fares for local rides on inter-county routes (Categories B & C).

With respect to intercounty transit service, the District has the capacity to increase fares and has in fact done so twice in the past three years. The District's "return from the farebox" (the percentage of transit operating expenses recovered by fares collected from passengers) is currently the highest in the State for the inter-county bus system, averaging about 53%. This is consistent with the District's internal policy that at least 50% of transit costs should be recovered from transit revenues.

The ferry system does not achieve this 50% cost recovery ratio. A four month long strike during 1979 had made computation to the ratio meaningless for the last financial year. Prior to the strike, the ferry system had a cost recovery ratio of 44% and is still among the highest in the state. Patronage was seriously reduced immediately following the strike. The District is pursuing a program to improve the economics of the ferries with a view to enable the system to meet the District's uniquely high farebox recovery targets. Additional seats on the vessels would help accommodate the peak period loads. Operating speeds and schedules have been adjusted to reduce costs and adjustments have been made to ferry and feeder bus fares. Most significantly, ferry crews are now working split-shifts to reduce labor costs, and the District is seeking federal assistance to replace the ferries' gas turbin engines with diesel engines.

A corollary goal of the District is to maintain transit fares at levels sufficiently low that passengers are attracted to public transit as an alternative to use of automobiles. To the extent that this goal is achieved, traffic is reduced, commute time shortened, the capacity of the transit system utilized and per-passenger costs held down. Increases in transit fares have predictable impacts on transit patronage - patronage being inversely related to fare charged. At some level of fare increase, patronage will be so adversely affected that total revenues decline.

The estimated impacts on revenue generation, patronage reduction and the associated increases in traffic, air pollution and fuel consumption from two possible increases are shown in Table 5-5. The fare increases shown are those associated with a 60% return from the farebox applied first to inter-county trips on District buses, and second to persons making "local" journeys within Marin County using the District controlled inter-county buses. The analysis used to develop the information in that Table assumes that the fare increases are enacted as an alternative to a toll increase i.e., that tolls remain at the \$1.00 level. Were both a toll increase and a fare increase to be enacted in combination, the reduction in vehicle miles, fuel consumption and emissions resulting from the toll increase would be offset by the increases in these impacts resulting from the fare increase.

It is seen that the effects of the fare increase for local Marin riders on inter-county buses is approximately one-fifth of the effect of the fare increase on inter-county trips on the same buses. The fare increase on inter-county trips would increase revenues by approximately \$1.2 million per year, approximately the same effect as Alternative A, or half the effect of Alternatives B, C or D. The fare increase would result in an additional 186 autos crossing the Bridge during the morning peak period, 200,000 gallons of fuel per year consumed and 100 tons per year of emissions generated.

5.1.5 Increasing Federal and State Subventions

The various components of Federal and State financial assistance available to the District are described in section 3.8. During FY 79/80, these sources provided approximately 22% of the operating revenues of the District's transit system and, in addition, covered 73% of its capital commitments. In all cases, the amounts of the subventions allocated for support of the District's transit system are subject to the judgement of federal, state, or regional agencies acting through an established cooperative process with representative local organizations. The District makes every effort to obtain State and Federal support of the District's transit system. The District is not aware of any further opportunities whereby it could increase Federal and State subventions as an alternative to the proposed toll increase.

5.2 Reducing Expenditures as an Alternative

5.2.1 Operating Economies

The major components of bus and ferry operating expense are shown in

Table 5-6. All components have increased in recent years, the highest rate of increase being that of fuel and lubricants. The trend in the cost of fuel purchased by the District is shown in Figure 5-1.

During 1979, the District hired a firm of management consultants to perform a Salary Survey and Management Audit of the District's operations and administration. The principal objectives of this work were to identify and put into effect all appropriate economies and attain the most efficient utilization of the District's available resources. Following review of the consultant's work, the District has made staffing changes, administrative and procedural changes, and is proceeding with various improvements to transit productivity.

Under requirements of state law, the District must work with the Metropolitan Transportation Commission (MTC) to prepare a Productivity Improvement Program (Reference 11) to demonstrate that productivity targets are being achieved. Under further requirements of state law, the District will, during the current fiscal year, submit to a Performance Audit to be made by an independent firm under contract to the MTC. This will evaluate the effectiveness with which the District is fulfilling its transit mission.

The District is undertaking a number of projects designed to improve productivity and efficiency. During the last two years, the District has negotiated with the unions to effect major improvements to the productivity of labor used in its transit operations. To enable operations to more efficiently adapt to morning and evening peak demand, ferry crews will now work "split shifts" and part-time bus drivers will be employed. The three-engine gas turbine powered ferries are being operated extensively using two engines or one engine to economize on fuel. These improvements are reflected in the Financial Projections (section 3.8). Additional seats are planned in the ferries and an additional row of seats in each of the commuter buses. Studies have indicated that substantial fuel economies could be achieved if the gas turbine vessels were to be refitted with diesel engines. Design studies for this conversion have been initiated. High capacity (articulated or double deck) buses have the potential to improve productivity. The District has successfully deployed ten 69-passenger articulated buses. It is testing the performance of these buses in commuter service and monitoring progress elsewhere with the use of double deck buses. Further developments with the use of high capacity buses are not predictable at this time and constitute a long term prospect. They are not an alternative to the proposed toll increase.

Federal and state regulations require that public transit operators make specific improvements to make public transportation more accessible to handicapped persons. The District intends to fully comply with these regulations and is working with representatives of handicapped persons in San Francisco, Marin, and Sonoma Counties to make these changes in the most effective way. By 1989, as required by the regulations, at least half of the District's buses will be equipped with lifts to assist disabled persons in boarding, and space on board will be provided for wheelchairs.

Drivers and mechanics will be trained on the new equipment. In the interim, the District will contract for a special service using lift-equipped vans to serve handicapped persons who are unable to use the buses. This program will incur substantial capital and operating costs which due to the preliminary state of plans have not yet been estimated and are not yet included in the Financial Projections.

5.2.2 Curtailing Transit Services

The only means by which the District could reduce its operating costs by an amount sufficient to avoid the need for additional revenues is through reduction of its transit services.

The District's Five Year Financial Projections are discussed in Appendix A. They show that total revenues available to support transit operations are the sum of farebox revenues from the bus and ferry operations, bridge toll revenues that are surplus to the needs of operating, maintaining, and repairing the Golden Gate Bridge, federal and state operating subsidies, and interest on invested reserves.

The projections anticipate inflation persisting over the period at varying rates: 8-1/2 % per annum for labor costs; 10% for equipment and supplies; and 15% for fuel. They assume a 1% growth in Bridge traffic and toll revenues and a somewhat higher growth in transit patronage and fare revenues. The growth in gross toll revenues, however, will be more than offset by the inflation in Bridge operating costs, resulting in a gradual decrease in the net amount of toll revenue available to support transit. Though the projections do not contemplate expansion of the transit system, and assume that the growth in patronage will be accommodated through increased load factors and retrofitting of buses with additional seats, the growth in farebox revenues will only partially offset the inflation in operating costs, and transit operating deficits will continue to grow.

The Five Year Projection in Appendix A shows that, given continuation of the existing tolls and fares, and a somewhat hypothetical assumption of continued operation of the transit system at current levels, available reserves would be eliminated before the end of FY 1980/81. Without additional revenues, restricted reserves would also be exhausted during 1983. In order to avoid consumption of these restricted reserves, it would be necessary to reduce transit operations sometime during 1981. The severity of these reductions would depend on the economies which could be realized by ending particular service runs and the degree to which transit patrons would revert to single or double occupant cars rather than carpools. In any event, service reductions on the order of 27% during FY 1981/82 would be required. With continued inflation, further cuts would be needed in subsequent years.

As shown in Table 1-1, service reductions of this magnitude would result in substantially greater vehicle miles traveled, pollutant emissions and fuel consumption than any of the alternative toll or fare increase options.

5.3 Consuming Reserves as an Alternative

The District's Board of Directors has established six separate reserve funds. Each is briefly described below.

1. Bridge Deck Replacement Reserve

After receiving a report in 1976 from the engineering firm of Ammann & Whitney on the deterioration of the Bridge roadway slab, the Board directed that a deck replacement reserve be created. The current (i.e., June 1980) level of this reserve is \$4.8 million. Annual contributions of \$1.5 million are scheduled under present Board policy, for the next three fiscal years; a final contribution of \$500,000 will be needed in FY 1983/84.

The Board also commissioned an independent review of the Ammann & Whitney report by the California Department of Transportation. The Caltrans report was submitted in July 1978. It confirms the conclusion that even with normal maintenance, continued accelerated deterioration will make a complete replacement of the roadway slab mandatory during the mid-1980's. Moreover, additional work to the approaches to the Bridge itself is needed to ensure their capability to withstand seismic forces.

As a result of legislation passed during 1978, the District became eligible for federal participation in the Bridge deck replacement and seismic safety upgrading project.¹ The estimated total cost of this project, including design, engineering and construction, is \$50 million. Under the 1978 legislation, the District must contribute 20% of the cost or approximately \$10 million in order to match the \$40 million in federal funds. Construction on the seismic upgrading is expected to begin in early 1981, with the deck replacement project commencing in 1982 and continuing through 1984.

The District, in order to meet its local share contribution, must contribute to (and draw down from) the Deck Replacement Reserve

¹ Eligibility is predicated on the District's operation of a federally assisted public transit system subsidized by Bridge toll revenues.

approximately \$5.2 million, in addition to the \$4.8 million already contributed to that reserve, over the next four years. Reduction of this reserve in order to meet transit operating deficits is impossible without jeopardizing the federal funding, without which the deck replacement and seismic safety projects could not be carried out.

2. Handicapped-Accessible Bus Reserve

In conjunction with the settlement of litigation which arose out of the 1977 toll and fare increase, the District committed itself to the purchase of new buses accessible to handicapped persons in wheelchairs. As an initial step, the District was obligated to establish a separate "Special Transit Vehicle Reserve" in the amount of approximately \$388,000 which, together with accrued interest, would be used for this purpose. The reserve stands at approximately \$400,000 (as of June 1980). The District has been successful in procuring Federal and State matching funds for the acquisition of the new accessible buses and expects to solicit bids from manufacturers during the current fiscal year. It is likely that this reserve will be obligated before June 1981 and spent (when the buses are delivered) in FY 1981-82. In any event, under the court approved settlement agreement, it is not available for purposes other than accessible bus acquisition.

3. Ferry Channel Dredging Reserve

As a result of siltation, periodic dredging of the Larkspur channel is required to permit continued operation of the District's ferry system between Larkspur and San Francisco.

Over a period of several years in the late 1970's, the District accumulated funds to cover the estimated dredging cost. The reserved amount is \$473,500; it was not increased last year and Board policy calls for no further contributions, until necessary dredging is performed.

4. Bus and Ferry Replacement Reserve (Depreciation Reserve)

The District initiated this reserve after the acquisition of the bus fleet in the early 1970's. Its function is to provide funds for the purchase of replacement buses and ferries when equipment now in operation comes to the end of its normal service life. The annual contribution to this reserve of approximately \$3.1 million) is based on straight line depreciation of original cost and thus does not account for the intervening 10 years of inflation which will increase the actual cost of replacing the bus fleet. Replacement is scheduled to commence in FY 1983/84 when buses will be in their twelfth year of service.

5. Uninsured Losses Reserve

Over the past few years, the District has reviewed its insurance program and determined to increase the levels of self-insured retentions (or deductibles) in an effort to reduce premium costs. This reduction in insurance coverage, of course, entails a corresponding increase in liability exposure; the District presently self-insures for the first \$500,000 per occurrence on Bridge related claims and \$250,000 bus and ferry claims. This reserve is intended to fund a portion of the risks assumed under this self-insurance program. As of June 1978 it stood at approximately \$1.2 million; Board policy calls for it to be funded (from premium savings) to an ultimate \$1.5 million level.

The District faces pending lawsuits with claims for which the District exposure, in the aggregate, exceeds the present level of this reserve by several millions of dollars.

6. Emergency Reserve

The Board of Directors has established an emergency reserve of \$5 million which is to be maintained at all times. The principal purpose of this reserve is to provide immediately available funds to repair structural damage to the Bridge, the Bridge approaches, ferry terminals and other District facilities in the event of major damage resulting from earthquakes, collision, storm or other disaster. In this regard, it should be noted that the District does not carry insurance on the Bridge approaches or terminals against damages due to seismic action. The District Engineer has advised that damage to the San Francisco and Marin approach spans and to the bus and ferry shore-side facilities could exceed \$5.0 million from a moderately severe earthquake.

In addition the Board established two reserves during FY 1979/80 which are shown in the Five Year Projection, Table A-1, as Transit Operations and working capital reserves. Combined, these stood at approximately \$2.5 million as of June 1980 but without new revenues will be consumed by funding transit deficits during the current fiscal year. One million dollars of this reserve should be maintained for working capital.

Consumption of restricted reserves to provide a temporary subsidy for transit operations would permit continued transit service at present tolls and fares until sometime in 1983 - each \$1 million consumed providing two to three months of subsidy. On the other hand, as the reserves decreased, the District would be unable to move ahead with the projects or respond to the contingencies for which the reserves were created. Thus, for example, depletion of the deck replacement/seismic upgrading reserve would preclude federal participation in that project and would render it beyond the District's financial capacity,

at least without a massive and immediate toll increase. Once the reserves were consumed, the District would then again face the identical problems considered in this report, although, because of inflation, the toll/fare increases or service reductions necessary would be larger than those required at present.

Table 5-1

Toll Increase Alternatives E, F, G, H and I

Private Autos:	Existing Tolls	Toll Increase Alternatives				
		Alt. E	Alt. F	Alt. G	Alt. H	Alt. I
COMMUTE PERIOD						
6-9 am; 4-6 pm Mon. thru Fri. except holidays						
1 occupant	1.00	1.25	1.50	1.50	1.50	1.50
2 occupants	1.00	1.25	1.50	1.25	1.25	1.00
3 or more occupants	FREE	FREE	FREE	FREE	FREE	FREE
ALL OTHER TIMES						
1 occupant	1.00	1.25	1.50	1.25	1.50	1.25
2 occupants	1.00	1.25	1.50	1.25	1.25	1.25
3 or more occupants	1.00	1.25	1.50	FREE	FREE	1.25

Table 5-2

Traffic Volumes At The Golden Gate BridgeFor Toll Alternatives E, F, G, H & I

(Southbound Traffic, Average for Fiscal Year 1981/82)

Traffic Vol. with Existing Tolls		Change Due To Increase:				
		Alt. E	Alt. F	Alt. G	Alt. H	Alt. I
<hr/>						
Weekdays 7-9 a.m.						
1 occupant	9,200	-140	-280	-330	-330	-370
2 occupants	2,600	- 30	- 60	0	0	+ 65
3 occupants	900	+ 20	+ 40	+ 40	+ 40	+ 35
Total 7-9 p.m.	12,700	-150	-300	-290	-290	-270
 Weekdays 4-6 p.m.						
1 occupant	3,000	- 45	- 90	-110	-110	-125
2 occupants	1,150	+ 14	- 30	0	0	+ 30
3 occupants	700	+ 16	+ 30	+ 30	+ 30	+ 25
Total 4-6 p.m.	4,850	- 15	- 90	-80	- 80	- 70
Total Peak Period Traffic Change		-330	-780	-740	-740	-680
 Total Traffic For FY 1981/82						
	37,000,000	-131,000	-290,000	-188,000	-214,000	-218,000

Table 5-3

Vehicle Fuel Consumption and EmissionsFor Toll Alternatives E, F, G, H & I

(All Northbound and Southbound Transbay Traffic For Fiscal Year 1981/82)

	With Existing Tolls	Change Due To Toll Increase:				
		Alt. E	Alt. F	Alt. G	Alt. H	Alt. I
Millions of Vehicle Miles Per Year	782.0	-2.8	-6.3	-4.1	-4.6	-4.7
Fuel Consumed (Thousands of Gallons Per Yr.)	39,882	-144	-319	-208	-236	-240
Emissions (Tons Per Yr.)						
CO	16,292	- 59	-130	- 85	- 96	- 98
HC	1,412	- 5	- 11	- 7	- 8	- 9
NO _x	2,208	- 8	- 18	- 11	- 13	- 13

Table 5-4

Increase in District Revenues from Alternatives E, F, G, H & I

Financial Year:

	1980/81 (Jan. thru June)	1981/82	1982/83	1983/84	1984/85
Annual Toll Revenue with Existing Tolls (Millions of Dollars)	8.39	16.95	17.12	17.29	17.46
Increase in Toll Revenues Due to Alternative (Millions of Dollars)					
Alt. E	2.06	4.17	4.21	4.25	4.30
Alt. F	4.10	8.28	8.36	8.44	8.53
Alt. G	0.87	1.75	1.77	1.79	1.81
Alt. H	1.70	3.42	3.46	3.49	3.53
Alt. I	2.28	4.61	4.66	4.70	4.75

Table 5-5

Impacts on Revenue, Traffic, Fuel Consumption, and Emissions
of Bus Fare Increases
(Fiscal Year 1981/82)

	60% Farebox Return from inter-county trips	60% Farebox Return local Marin Patrons on inter-county buses
Revenue (thousands of dollars)	\$1,230	\$260
Traffic at the Golden Gate Bridge (thousands of autos per year)	182	0
Fuel Consumption (thousands of gallons per year)	201	41
Emissions (tons per yr.)		
CO	82	17
HC	7	1
NO _x	11	2

TABLE 5-6

DISTRIBUTION OF TRANSIT EXPENDITURES

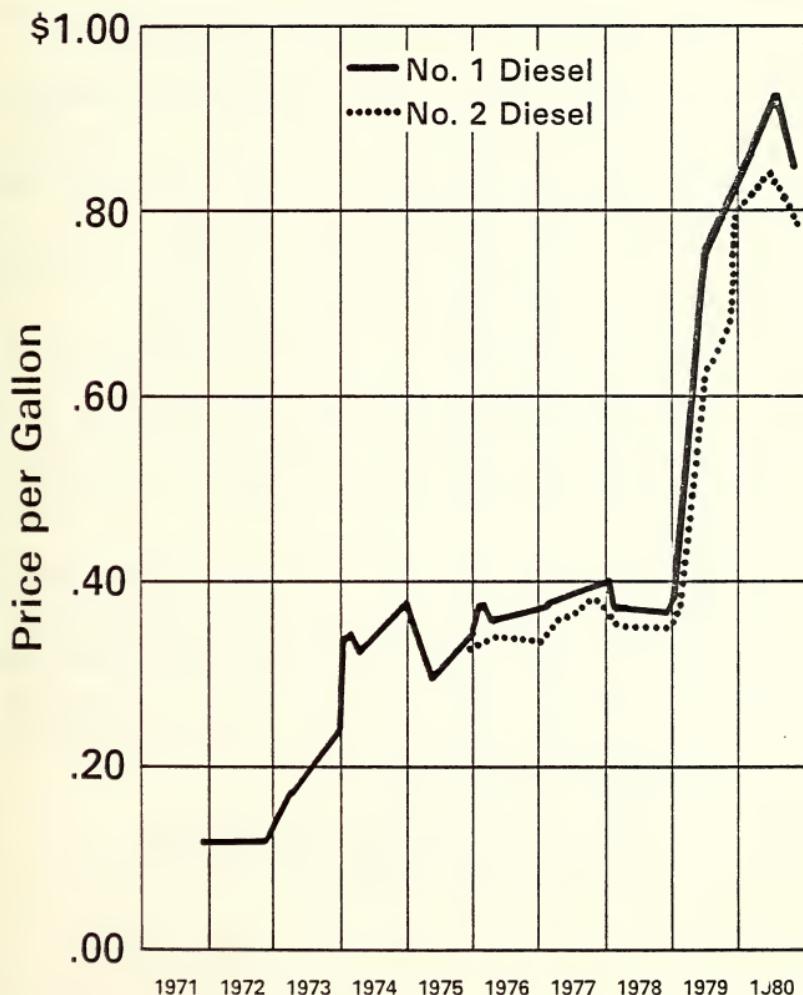
(FY 1980/81 Transit Operating Budgets)

	<u>PERCENT OF BUDGET</u>	
	<u>BUS DIVISION</u>	<u>FERRY DIVISION</u>
Fuel & Lubricants	10%	21%
Depreciation	2%	3%
Wages - Drivers or Crew	41%	14%
Other wages, Salaries & Fringe Benefits	32%	24%
District Overhead	5%	17%
Supplies, Insurance, Utilities and Other	<u>10%</u>	<u>21%</u>
	100%	100%

nlm

Diesel Fuel Price History

Bus Transit



AUTHORS AND PERSONS CONTACTED

This report has been prepared pursuant to the Board of Director's Resolution No. 80-427 of October 3, 1980. The report was drafted by District staff members Peter Dyson, Alan Zahradnik, and Joy Dahlgren under supervision of Jerome M. Kuykendall, Director of Planning and Policy Analysis, and under the direction of Dale W. Luehring, General Manager.

Various agencies were contacted in order to obtain information for the analysis of air quality and fuel consumption impacts. They were:

CALTRANS - Highway Operations Branch, James McCrank

- Environmental Planning Branch, John Gensler, Russell Weeks

Bay Area Air Quality Management District, Tom Perardi

Metropolitan Transportation Commission, Vince Petrites

Russell Weeks prepared the estimates of auto emissions and fuel consumption using the California Air Resources Board's EMFAC model and data supplied by the Golden Gate Bridge, Highway and Transportation District.

Ray McDevitt, partner with the law firm Hanson, Bridgett, Marcus, Vlahos and Stromburg of San Francisco, provided guidance on the form and content of the report. The draft was reviewed by the following senior staff of the District:

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ECONOMIC AND ENVIRONMENTAL ANALYSIS
OF
PROPOSED TOLL INCREASES

APPENDIX A
DISTRICT FINANCIAL PROJECTIONS

1. Introduction

Each year the District's Auditor-Controller prepares Five Year Projections of the District's financial condition. The most recent Projection was completed on November 3, 1980. It is included in Chapter 3 (Table 3.17) of the Economic and Environmental Analysis of Proposed Toll Increases and in this Appendix as Table A-1.

The projection of the District's future financial condition is only a planning tool. It is not an audited statement of financial condition for a complete fiscal year. Accordingly, projections of succeeding years' finances can change markedly as conditions in the current year differ from those anticipated when earlier projections were made.

2. Five Year Projection

A forecast of the District's financial position from the current fiscal year 1980/81 through fiscal year 1984/85 is presented in Table A-1. The assumptions used to develop this projection are shown in Table A-2. The projection is based on the District's fiscal year 1979/80 end of year audited financial position and on the current fiscal year 1980/81 budget, as amended through October, 1980.

The District's budget is prepared annually in advance of the upcoming fiscal year. For example, the FY 80/81 Budget preparation process began in December, 1979 with the various Divisions and Departments developing preliminary budgets. These preliminary budgets were reviewed by the General Manager and Auditor-Controller. Revised budgets were then presented to the District Board of Directors' Finance Committee for further review and revision. The final FY 80/81 budget was adopted by the Board of Directors in July, 1980; six months after the initiation of the budget preparation process. Budget adjustments are commonly adopted by the Board of Directors over the course of the year as actual revenue and expense figures become available and enable staff to more accurately estimate future expenses and revenues.

2.1 Operation and Capital Budget and Projection

The District's FY 80/81 Budget is comprised of the budgets of each of its four operating divisions: Bridge, Bus, Ferry, and Ride-sharing; plus the budgets of its eight District Division departments: General Manager, Secretary, Auditor-Controller, Engineering, Marketing, Personnel, District Services, and Planning and Policy Analysis. Summaries of the five divisional operating budgets are presented in Tables A-3 through A-11.

The final FY 80/81 budgeted operating expenses and operating revenues were projected for FY 81/82 through FY 84/85 according to

the assumptions (in Table A-2) on inflation, Bridge traffic and transit patronage, and state and federal subventions were prepared for the five year period on the basis of MTC estimates of the future level of funding from these non-local sources.

In addition to the operating budget and projections, a capital budget is prepared. The capital budget contains all capital improvements planned for the fiscal year. The FY 80/81 capital improvements for the Bridge, Bus, and Ferry divisions are presented in Tables A-12 through A-14. A five year program of capital improvements is also prepared from projects submitted by the divisional managers to meet their Division's short term needs and by the Planning Department to meet the District's overall long range needs. The Five Year Transit Capital Improvement Program is included in the District's Five Year Plan (Reference 3), available from the Secretary of the District. Capital expenditures of 20% total project cost (with UMTA funding of the remaining 80%) are assumed over the five year period for the Bus and Ferry Divisions.

2.2 District Reserves

As described in Chapter 5.3, the District's Board of Directors has established six separate reserve funds: (1) Bridge Deck Replacement; (2) Handicapped - Accessible Bus Purchase; (3) Ferry Channel Dredging; (4) Bus and Ferry Replacement; (5) Uninsured Losses; and (6) Emergency.

About \$1.5 million per year is diverted from surplus Bridge toll revenues to the deck replacement reserve in FYs 80/81, 81/82, 82/83 with a final \$0.5 million contribution in FY 83/84. Nearly \$5 million is currently in the reserve. A total of \$10 million will be collected to match an additional \$40 million provided by the Federal government for this \$50 million project. All \$10 million will be spent from the reserve by FY 84/85.

Approximately \$400,000 has been placed in a reserve to purchase new buses accessible to handicapped persons in wheelchairs. No additional contributions to this reserve are planned. The funds are scheduled to be spent in FY 80/81.

To permit continued Larkspur Ferry operation, \$473,500 has been placed in a reserve for dredging the Larkspur channel. No additional contributions to this reserve are planned. The spending of these funds is not presently scheduled.

About \$3.1 million is currently in a reserve to replace the District's existing bus and ferry fleet at the end of their service lives. This replacement reserve is scheduled to receive \$400,000 per year from the Bus Division's revenues and \$139,000 per year from the

Ferry Division's revenues. In FY 83/84, \$830,000 is scheduled to be spent from this reserve on bus replacements and another \$895,000 in FY 84/85 as the 20% local match to the remaining 80% federal funding of bus purchases.

About \$1.2 million is currently in a reserve to cover potential risks assumed under a self-insurance program. Board policy calls for an ultimate \$1.5 million reserve, funded through premium savings effected from self-insurance. This additional \$0.3 million requirement is not reflected in the reserve requirements shown in the Five Year Projection.

The Board of Directors has established an emergency reserve of \$5 million which is to be maintained at all times. This reserve is currently fully funded. No drawdowns or additions are scheduled in the five year period.

Finally, during FY 79/80 the District's Board of Directors instructed the Auditor-Controller to establish two new reserve accounts: a reserve of \$1 million for working capital and a reserve of about \$1.6 million for transit operations. The \$1.6 million reserve is available for covering transit deficits and is scheduled to be expended fully in FY 80/81.

A history of the District's reserve accounts and expenditures is presented in Table A-15.

2.3 Federal and State Subventions

2.3.1 Federal Sources

Federal funding for transit is provided in the form of grants from the Urban Mass Transportation Administration. The titles of these grants are taken from the section headings of the Urban Mass Transportation Act of 1964, as amended.

Section 3. This section provides for the acquisition, construction, or improvement of transit facilities and equipment. The District has been granted 43.9 million dollars from Section 3 monies over the last nine years for the construction of the present transit system. Section 3 funds are awarded at the discretion of UMTA. The District has received no additional Section 3 grants since 1977.

Section 5 Operating. The District receives money from this section to offset transit operating deficits. Congress apportions the money according to urbanized area size. The District applies to the State of California for Santa Rosa urbanized area funds and to

MTC for the Oakland/San Francisco urbanized area funds. Together these funds equaled \$1.75 million dollars in 1978/79 and 1.35 million in 1979/80. It is expected the District's share of Section 5 funds will increase in subsequent years due to a proposed change in the federal apportionment method.

Section 5 Capital. A portion of Section 5 funds are set aside for capital replacement. These funds are allocated by MTC to operators in the San Francisco urbanized area. Since the District has not received any Section 3 funds since 1977, this fund has been the District's only source of federal capital funds. In 1979/80, the District was granted \$1,060,000 and in 1980/81, \$1,387,600. In each case, this was about one-half of District requests. In order to maximize use of federal funds, capital projects are deferred where possible until federal funds are available.

Section 6 Methods and Demonstrations. The District has received two grants, one for \$1,001,526 to demonstrate vanpooling, and one for \$219,000 to demonstrate a form of carpooling. The result of these grants is the establishment of the Ridesharing Division. Currently few federal funds are available for operating expenditures of this division.

Section 8 Planning and Technical Studies. UMTA requires the District to annually update its Five Year Plan. The District receives \$80,000 from UMTA through MTC to fund 80% of the cost of developing the plan.

Section 10 Training Grants. The District has received about 10 grants of about \$5,000 each over the last 5 years. These grants fund 75% of management training courses given by UMTA.

Section 18 Non-Urban Grants. This section of the act grants operating and capital money to the operator who provides service to non-urban areas. The District's West Marin and Sebastopol inter-county services may qualify for funding. Their eligibility has not yet been determined and, therefore, the District has not applied for any funds under this section. The impact on revenues from this limited source would be relatively small. Marin County Transit District is applying for these funds for new local intra-county services in West Marin.

Generally, all UMTA grants are subject to approval of either the State of California or the Metropolitan Planning Organization, MTC. The District must share the available money with other transit operators, primarily BART, AC Transit, SamTrans, and MUNI which serve much larger populations and receive larger portions of the money.

2.3.2 State Subventions

State funds come from two sources: SB 325 Transportation Development Act funds; and SB 620 State Transit Assistance.

Transportation Development Act or TDA funds are allocated by county. The funds are generated from the state sales tax. One-quarter percent out of the 6% sales tax goes to the fund. The District receives TDA money from San Francisco, Marin, and Sonoma Counties to offset operating expenses. The District's Club Bus service originating in Napa County may be eligible for TDA money, but so far the District has been unable to claim it. MTC receives a portion of TDA revenues for its operations and allocates the rest to eligible claimants. In San Francisco, MUNI, BART, and SanTrans are eligible and the District receives only 2% of the fund. In Marin, the District and Marin County Transit split the fund. Marin County Transit purchases local service from the District with most of its share. The District reserves 5% of Marin TDA money for special elderly and handicapped services. The District has recently signed a 3 year contract for the division of TDA funds in Marin. In Sonoma, the funds are divided between the District, local public transit services in the county, and public streets and highway projects.

In 1978/79, the District received \$4.06 million from the three counties and in 1979/80, it received \$4.16 million. The projections for the next 5 years' TDA funds due the District were supplied to the District by MTC.

SB 620 State Transit Assistance was established by the State of California in 1979 and is only a three year program. MTC is charged with disbursing the regional appropriation from this Act. Funds are divided into two sections: The first section, consisting of 75% of the total money available to the region is apportioned to each county and then disbursed among the eligible claimants of each county. The District received no money under this section from Sonoma and San Francisco Counties. In Marin, the District will receive \$809,000 over three years (This is 67% of the fund). The money will be used to purchase accessible buses.

The second section of the fund, the remaining 25%, is allocated directly by MTC on a project by project basis. The District expects to receive about \$500,000 of this money for various capital projects, including the planning for regional transportation centers and building bus shelters.

SB 620 State Transit Assistance also provides for a state appropriation. In 1979/80, the District received \$700,000 for bus purchases. In 1980/81, the District applied for \$285,000 of capital and demonstrations projects to benefit the handicapped.

Table A-1

COST OF CAPITAL, AND INVESTMENT, BUDGETARY AND INVESTMENT ALLOCATION BY FUND

FIVE YEAR FINANCIAL PROJECTION - FISCAL YEARS 1980/81 - 1984/85

	1980/81	1981/82	1982/83	1983/84	1984/85
Beginning Reserves					
Net Capital Reserves	\$ 15,015,146	\$ 15,791,116	\$ 16,515,116	\$ 17,241,116	\$ 17,941,116
Available Reserves	1,555,050	0	0	0	0
Reserve for Liabilities - Capital	1,000,000	0	0	0	0
Reserve for Market Capital					
Mid-Year Budget					
Net Capital Reserves	\$ 16,481,000	\$ 16,250,500	\$ 17,130,000	\$ 17,291,200	\$ 17,484,000
Net Liabilities - Capital	1,500,000	1,516,600	1,500,000	1,500,000	1,500,000
Operating Expenses	(8,439,000)	(9,266,800)	(10,100,000)	(11,027,800)	(11,979,000)
Capital Expenditures	(1,500,000)	(1,500,000)	(1,500,000)	(1,500,000)	(1,500,000)
Reserve Requirements	\$ 2,544,310	\$ 2,166,739	\$ 6,372,111	\$ 6,936,361	\$ 6,462,869
Reserve Division					
Operating Expenses	\$ 10,961,756	\$ 11,162,766	\$ 12,934,767	\$ 11,930,077	\$ 10,964,206
Capital Expenditures	(20,881,000)	(22,063,272)	(23,904,563)	(22,476,018)	(21,485,563)
Reserve Requirements	(193,720)	(455,000)	(620,000)	(719,000)	(720,000)
Reserve Liabilities	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Net Capital Division (Net Util)	\$ (5,921,511)	\$ (6,355,625)	\$ (1,200,138)	\$ (1,816,459)	\$ (6,462,869)
Provisional Budget					
Operating Expenses	\$ 1,250,000	\$ 1,391,200	\$ 1,365,500	\$ 1,379,500	\$ 1,391,500
Capital Expenditures	(10,117,975)	(9,956,525)	(9,994,192)	(11,036,866)	(11,195,100)
Reserve Requirements	(66,160)	(122,200)	(123,000)	(123,000)	(123,000)
Reserve Liabilities	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Net Capital Division (Net Util)	\$ (1,543,593)	\$ (1,648,593)	\$ (4,501,593)	\$ (5,326,186)	\$ (6,126,251)
Reconciling Balances					
Operating Expenses	\$ 1,200,116	\$ 265,881	\$ 362,962	\$ 822,115	\$ 862,221
Capital Expenditures	(45,000)	(1,625,515)	(1,595,167)	(1,759,171)	(1,759,171)
Reserve Liabilities	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Mid-Year Capital Expenditure	\$ (725,165)	\$ (601,117)	\$ (801,449)	\$ (931,672)	\$ (1,065,900)
Mid-Year Capital Expenditure	\$ 1,212,265	\$ 1,212,265	\$ (12,265)	\$ (12,265)	\$ (12,265)
Budget Adjustment - FY 1980/81	\$ 5,306,870				
Total Budgeted Benefit	\$ 1,316,016,216	\$ 15,921,516	\$ 15,791,200	\$ 17,130,000	\$ 17,241,116
Available Reserve Expenditure					
Cover Benefit	\$ 2,555,050	\$ 0	\$ 0	\$ 0	\$ 0
Budget to 30th June 1980 AD	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Net Capital Reserve Expenditure					
Additions	\$ 1,500,000	\$ 2,019,000	\$ 2,019,000	\$ 1,039,000	\$ 1,039,000
Budget Reserve Expenditure	\$ 1,261,000	\$ 1,261,000	\$ 1,261,000	\$ 1,261,000	\$ 1,261,000
Reserve Reserve Expenditure	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Total Reserve Expenditure	\$ 15,817,736	\$ 11,009,106	\$ 11,009,106	\$ 11,009,106	\$ 11,009,106
Capital Reserve Expenditure	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Budget Reserve Expenditure	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000

TABLE A-2

GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT

FIVE YEAR FINANCIAL PROJECTION - FISCAL YEARS 1980/81 - 1986/85

ASSUMPTIONS

1. Fiscal Year 1980-81 includes the approved operating and capital budgets, including adjustment to the budgets through October 1980.
2. Fiscal Year 1980/81 includes the purchase of 12 advance-design buses from the Restricted Reserve for Bus Replacement.
3. Fiscal Years 1981/82 through 1986/85 include a 10% rate of investment return.
4. Present toll and fare structures are included over the five-year period.
5. Bus replacement purchases of 25 buses in years 1983/84 and 1984/85 from the Restricted Reserve for Bus Replacement.
6. Bridge traffic increases 1% per year over 5 years.
7. Bus patronage increases 9% in Fiscal Year 1981/82 which declines to a 7% increase in 1986/85. No change in average fare per passenger.
8. Sausalito patronage increases 2% to one million in 1981/82 and remains constant thereafter. No change in average fare and concession per passenger.
9. Larkspur patronage increases 10% per year over 5 years. No change in average fare and concession per passenger. Feeder bus patronage and revenue also increases 10% per year.
10. All transit capital expenses funded 20% District and 80% BART. Bridge capital expenses are 80% FHWA and 20% District reserve (deck replacement) or 100% District.
11. Depreciation has been excluded from operating expenses (cash flow basis).
12. Inflation factors are figured according to SB 862 guidelines for Fiscal Years 1981/82 through 1986/85 at 8-1/2% for labor, 10% for materials and supplies and 15% for fuel.

TABLE A-3
BUDGET OF RECOMMENDATIONS — REVENUE
 — San Jose Buses, Highway and Interurbane Lines
 FISCAL YEAR 1980/81

BUDGET DIVISION	FISCAL YEAR	1979/80		FISCAL YEAR 1980/81	
		ESTIMATED REVENUE	ADJUSTMENTS	ESTIMATED REVENUE	RECOMMENDED BY REVENUE FROM THE FOLLOWING SOURCES
1. REVENUE FROM THE FOLLOWING SOURCES					BASED ON APPROVED BUDGET
2. Bus Fare Tolls	10	\$ 16,702,200	0	\$ 16,783,000	16,783,000
3. State Reimbursement for Land Diversions	11	\$ 96,000	94,000	\$ 140,000	140,000
4. Employee Vacation	12	—	—	2,300	2,300
5. Rental Semitrucks	13	—	—	1,200	1,200
6. Sub-Total	14	\$ 16,798,200	—	\$ 16,921,200	16,921,200
7. Interest Income	15	\$ 1,200,000	—	\$ 1,821,600	1,821,600
8. Total	16	\$ 11,998,200	—	\$ 18,749,600	18,749,600
9.	17	—	—	—	—
10.	18	—	—	—	—
11.	19	—	—	—	—
12.	20	—	—	—	—
13.	21	—	—	—	—
14.	22	—	—	—	—
15.	23	—	—	—	—
16.	24	—	—	—	—
17.	25	—	—	—	—
18.	26	—	—	—	—
19.	27	—	—	—	—
20.	28	—	—	—	—
21.	29	—	—	—	—
22.	30	—	—	—	—
23.	31	—	—	—	—
24.	32	—	—	—	—
25.	33	—	—	—	—
26.	34	—	—	—	—
27.	35	—	—	—	—

TABLE A-4
BUDGET ESTIMATES & RECOMMENDATIONS - EXPENSES
 Non Line Bridge Recovery and Improvement Fund
 FISCAL YEAR
 1980/81

BUDGET DIVISION	ACCOUNT	DESCRIPTION	FISCAL YEAR		FISCAL YEAR 1979/80	RECOMMENDATION BY COMMITTEE MANAGER	AMOUNT	RECOMMENDATION BY COMMITTEE MANAGER	AMOUNT
			1	2					
1	1	1. SALARIES	1	2	ACTUAL EXPENSE	ADJUSTED BUDGET	ADJUSTED EXPENSE	ADJUSTED EXPENSE	ADJUSTED EXPENSE
2	2	2. PERSONNEL	3	4	4,510,400	4,412,400	4,412,400	4,412,400	4,412,400
3	3	3. VACATION PAY	5	6	20,000	21,400	23,000	23,000	23,000
4	4	4. OPERATION	7	8	13,600	11,000	41,000	34,000	34,000
5	5	5. FRINGE BENEFITS	9	10	1,198,500	1,150,813	1,239,692	1,222,692	1,222,692
6	6	6. SERVICES	11	12	5,000	5,000	1,000	1,000	1,000
7	7	7. PROFESSIONAL	13	14	115,000	115,000	115,000	115,000	115,000
8	8	8. LEGAL	15	16	13,000	11,200	13,200	11,200	11,200
9	9	9. LEGISLATIVE	17	18	58,600	12,200	56,400	0	0
10	10	10. PUBLIC RELATIONS	19	20	3,100	3,100	3,630	3,630	3,630
11	11	11. AUDIT	21	22	11,100	11,200	11,200	11,200	11,200
12	12	12. MAINTENANCE	23	24	10,100	10,800	13,800	13,800	13,800
13	13	13. EQUIPMENT	25	26	8,000	8,000	8,400	8,400	8,400
14	14	14. OTHER	27	28	1,000	1,000	1,000	1,000	1,000
15	15	15. MATERIALS AND SUPPLIES	29	30	81,400	81,400	115,000	115,000	115,000
16	16	16. Fuel and Lubricants	31	32	1,400	1,400	1,400	1,400	1,400
17	17	17. Tires and Tubes	33	34	299,200	299,200	296,800	296,800	296,800
18	18	18. OPERATING SUPPLIES	35	36	5,000	5,000	400	400	400
19	19	19. OFFICE SUPPLIES	37	38	160,600	160,600	191,000	191,000	191,000
20	20	20. FUEL OIL	39	40	1,000	1,000	1,000	1,000	1,000
21	21	21. OTHER	41	42	1,000	1,000	1,000	1,000	1,000
22	22	22. OTHER	43	44	1,000	1,000	1,000	1,000	1,000
23	23	23. OTHER	45	46	1,000	1,000	1,000	1,000	1,000
24	24	24. OTHER	47	48	1,000	1,000	1,000	1,000	1,000

TABLE A-4
BUDGET ESTIMATES & RECOMMENDATIONS — EXPENSES
 Long Distance Bridges, Highways and Transportation District

BUDGET ESTIMATES for RECOMMENDATIONS — EXPENSES
 for Gate Bridge, Highway and Transportation District
 FISCAL YEAR 1941-1942

TABLE A-5
BUDGET ESTIMATES & RECOMMENDATIONS - REVENUES
Graham State Bank, Highway and Transportation Block 1
FISCAL YEAR
1980/81

BUS. BAND/UNIT DIVISION	FISCAL YEAR	FISCAL YEAR		FISCAL YEAR		FISCAL YEAR		FISCAL YEAR	
		ACTUALS	APPLIED	ACTUALS	ESTIMATED	RECOMMENDED	RECOMMENDED	APPROVED	APPROVED
1. Accrued 2. Taxes	3.								
4. Purchases	5.	9,311,500	17,253	9,316,743	9	10,310,000	981,257	11,511,000	11
6. Charter Service	7.	100,000	100,000	62,000	0	20,000	532,000	20,000	2
8. Club Bns	9.	453,500	(453,500)	0	0	0	0	0	0
10. Other	11.					14,600	14,600	14,600	4
12. Sub. Total	13.	9,875,000	(486,257)	9,398,743		10,344,400	10,344,400	11,548,400	
14. State TIR Funds	15.					3,179,100	3,179,100	3,179,100	3
16. Federal Operating Assistance	17.	3,110,000		3,110,000		921,200	921,200	44,400	911,200
18. State TIR Planning Funds	19.	876,800		876,800		20,000	20,000	10,000	20,000
20. Federal Section & Planning Funds	21.					65,000	65,000	60,000	60,000
22. Subtotal	23.	6,014,800		6,014,800		4,750,300	4,750,300	3,750,300	4,750,300
24. Total	25.	13,899,800	(486,257)	13,413,543		15,076,300	15,076,300	14,987,157	15,076,300
26. Balance	27.	6,700,000	66,000	6,766,000		9,200,000	9,200,000	5,525,000	9,200,000
28. Revenue Passenger	29.	8,001,400	18,277	8,220,077		10,182,400	10,182,400	10,482,500	1
30. Impartial Revenue per Passenger	31.							1,07	
32. Impartial Salary per Passenger	33.							42	
34. Total	35.							50	
36. Total	37.								
38. Total	39.								
40. Total	41.								
42. Total	43.								
44. Total	45.								
46. Total	47.								

TABLE A-6
BUDGETES-MAKES & RECOMMENDATIONS — EXPENSES
 for State Books, Highway and Transportation Projects
 FISCAL YEAR 1960/61

ITEM	ITEM	ITEM	1959/60		1960/61	
			1959/60	1960/61	1959/60	1960/61
1. ACCIDENTS	2. DESCRIPTION	3. ACTUAL EXPENSE	4. BUDGET	5. ADJUSTMENT	6. RECOMMENDED EXPENSE	7. RECOMMENDED EXPENSE
5.1. SALARIES		10,918,111	14,634	11,018,406	11,681,152	11,681,152
5.2. * Financial		21,351	22,551		4,155,545	4,155,545
5.3. * General					4,157,654	4,157,654
5.4. * Other					3,555,401	3,555,401
5.5. * Total		3,144,609	22,351	3,186,651		
5.6. * PRIME EXPENSES						
5.7. SERVICES						
5.8. * Professional and Technical						
5.9. * Legal		4,500	10,500	15,000	4,750	4,750
5.10. * Legislative		95,000	95,000	95,000	95,000	95,000
5.11. * Public Information		12,400	13,300	13,300	13,300	13,300
5.12. * Audit		20,500	16,000	16,300	0	0
5.13. * Contractual		6,500	7,150	7,150	7,150	7,150
5.14. * Ticket Expenses		23,400	23,400	23,400	620	620
5.15. * Total Services		44,000	44,000	44,000	4,840	4,840
5.16. * REIMBURSEMENT						
5.17. * Fuel and Lubricants		1,104,600	994,473	1,049,873	2,000,410	2,000,410
5.18. * Tires and Tires		1,011,300	9,000	11,100	199,000	199,000
5.19. * Office Supplies		223,209	10,912	253,272	239,430	239,430
5.20. * Office Supplies		49,400	16,233	41,166	50,000	50,000
5.21. * Repair Parts		450,100	3,800	464,100	621,389	621,389
5.22. * Repair Parts		60,000			10,000	10,000
5.23. * Proprietary Supplies						
5.24. * Total		81,200			121,000	121,000
5.25. * Fuel and Lubricants						
5.26. * Total						

TABLE A-6
BUDGET ESTIMATES & RECOMMENDATIONS — EXPENSES¹
In Case Books, Register and Transcripts Divided
Fiscal Year
1980/81

ITEM NUMBER	ACCOUNT CODE	DESCRIPTION	FISCAL YEAR	1979/80		RECOMMENDED BY	FISCAL YEAR		1980/81	
				ACHIEVEMENT EXPENSES	ADJUSTMENTS		ESTIMATED EXPENSES	AMOUNT	ESTIMATED EXPENSES	AMOUNT
1				4	6		6	6		6
2		TRANSFERRED TRANSFORMATION SERVICES								
3		• Electricity and Heat/Cool		11,900		11,900		13,000		13,000
4		LEASES AND RENTALS								
5		• Equipment (A/C Boxes)		21,500		21,500		25,250		25,250
6		• Office Equipment		41,000		41,000		42,318		42,318
7		• Renting		55,000		55,000		57,000		57,000
8		BUILDINGS								
9		• Telephone		51,000		51,000		51,250		51,250
10		• Other (Gas, electric, etc.)		89,200		89,200		101,123		101,123
11		INSURANCE								
12		• Liability, Prop., Damage, etc.		301,600		301,600		482,200		482,200
13		HOSPITALITY								
14		• Beer and Selected Liquor		3,200		3,200		10,690		10,690
15		• Travel and Lodging		1,200		1,200		3,250		3,250
16		OPERATION								
17		• Equipment		481,300		481,300		481,300		481,300
18		• Buildings		35,500		35,500		35,200		35,200
19		• Fixtures and Fittings		3,200		3,200		3,200		3,200
20		Stocks		18,064,083		18,322,469		20,391,747		20,365,528
21		EXCHANGES								
22		• Higher Education (Graft)		55,800		55,800		91,123		91,123
23		• Faculty Position (Faculty Replacement)		101,000		99,000		140,000		135,000
24		• Faculty Position (Instruction)								
25										

BUDGET & RECOMMENDATIONS — EXPENSES
 after State Budget, Agency and Appropriation Check
 (FISCAL YEAR
 1980/81)

ITEM/EXPENSE DIVISION	ITEM/EXPENSE	FISCAL YEAR		FISCAL YEAR		FISCAL YEAR		FISCAL YEAR	
		ACTUAL PERIOD 5	BUDGET ADJUSTMENTS	ESTIMATED EXpenditure for Period 6	RECOMMENDED BY REVENUE AUTHORITY ACCOUNT				
1. <i>GENERAL EXPENSE</i>	1.1. <i>GENERAL EXPENSE</i>	41,758	41,656,608	41,758	1,380,170	1,373,565	208,952	1,373,289	208,952
	1.1.1. <i>Administrative</i>				65,250	65,250	15,250	65,250	15,250
	1.1.2. <i>Operating Expenses</i>				21,412,192	21,406,187	2,143,810	21,401,692	2,143,810
	1.1.3. <i>Capital</i>								
	1.1.4. <i>Other</i>								
	1.2. <i>Interest on Debt</i>								
	1.3. <i>Other</i>								
2. <i>DEBT SERVICE</i>	2.1. <i>Debt Service</i>								
	2.1.1. <i>Interest</i>								
	2.1.2. <i>Principle</i>								
	2.1.3. <i>Other</i>								
3. <i>TRANSFERS</i>	3.1. <i>Transfers</i>								
	3.1.1. <i>Transfers to</i>								
	3.1.2. <i>Transfers from</i>								
4. <i>RESERVE FUND</i>	4.1. <i>Reserve Fund</i>								
	4.1.1. <i>Reserve Fund</i>								
	4.1.2. <i>Reserve Fund</i>								
	4.1.3. <i>Reserve Fund</i>								
	4.1.4. <i>Reserve Fund</i>								
	4.1.5. <i>Reserve Fund</i>								
	4.1.6. <i>Reserve Fund</i>								
	4.1.7. <i>Reserve Fund</i>								
	4.1.8. <i>Reserve Fund</i>								
	4.1.9. <i>Reserve Fund</i>								
	4.1.10. <i>Reserve Fund</i>								
	4.1.11. <i>Reserve Fund</i>								
	4.1.12. <i>Reserve Fund</i>								
	4.1.13. <i>Reserve Fund</i>								
	4.1.14. <i>Reserve Fund</i>								
	4.1.15. <i>Reserve Fund</i>								
	4.1.16. <i>Reserve Fund</i>								
	4.1.17. <i>Reserve Fund</i>								
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	4.1.173. <i>Reserve Fund</i>								
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TABLE A-7
BUDGET E: MALES & RECOMMENDATIONS — REVENUE
 When this Block, Highway and Transportation District
 FISCAL YEAR 1960/61

FERRY DIVISION

GENERAL FUND	ACCOUNT CODE	DESCRIPTION	FISCAL YEAR		FISCAL YEAR		RECOMMENDED BY SPECIAL COMMITTEE FOR 1960/61	RECOMMENDED BY SPECIAL COMMITTEE FOR 1960/61	FERRY DIVISION	FERRY DIVISION	FERRY DIVISION
			1959/60	ACTUAL REVENUE	BUDGET	ESTIMATED BUDGET					
1	6	Permits Revenue	3,604,100	6	1,457,000	1,911,100	1	3,250,000	1,382,200	3,250,000	1
2	7	Concession Commission	729,400	114,500	24,000	24,000	2	200,000	35,500	200,000	2
3	8	Federal Tax Revenue	3,631,500	1,521,900	2,095,600	2,095,600	3	30,500	14,500	30,500	3
4	9	Subtotal					4	1,616,200	3,489,300	1,192,900	3,489,300
5	10	State Tax Funds					5		981,919	2,015,119	981,919
6	11	Federal Operating Revenue	473,200	473,200	473,200	473,200	7	490,770	490,770	11,250	490,770
7	12	State Tax Planning Funds					8	10,000	10,000	10,000	10,000
8	13	Federal Section 8 Planning Funds					9	20,000	20,000	20,000	20,000
9	14	Subtotal		1,490,600	1,490,600	1,490,600	10	1,508,109	318,109	1,508,109	318,109
11	15	Total		5,226,100	1,521,900	3,206,200	12	4,597,209	4,597,209	4,597,209	4,597,209
12	16	Total Passengers		2,729,400	691,000	1,208,400	13	1,037,000	2,027,000	768,400	2,027,000
14	17	Operating Revenue Per Passenger					14			1,70	1,70
15	18	District Subsidy Per Passenger					15		1,68	1,68	1,68
16	19						17				
18	20						19				
21	22						21				
22	23						23				
23	24						24				
24	25						25				

TABLE A-3
BUDGET ESTIMATES & RECOMMENDATIONS - EXPENSE^a
New Date: May 22, 1960
New Page and New Revision Date
FISCAL YEAR 1960/61

EXPENSE ITEM	ITEM NUMBER	BUDGET		RECOMMENDED		EXTRA	
		ITEM NUMBER	ACTUAL EXPENSE	ITEM NUMBER	ESTIMATED EXPENSE	ITEM NUMBER	ITEM NUMBER
1. REVENUE	1	56,419.78		1	56,419.78		
2. EXPENSE	2	2,817,200	(638,053)	1,791,355	2,519,353	716,798	2,515,476
3. EXPENSE	3	154,392	(154,392)	96,564	205,923	106,614	105,911
4. EXPENSE	4	1					
5. EXPENSE	5	651,500	(195,687)	456,013	680,210	105,951	69,970
6. EXPENSE	6	1					
7. EXPENSE	7	0	35,000	0	0	(15,000)	0
8. EXPENSE	8	100,000	4,000	104,000	114,000	0	115,000
9. EXPENSE	9	12,400	1,000	13,100	13,100	0	13,100
10. EXPENSE	10	2,500	2,500	3,000	3,000	0	3,200
11. EXPENSE	11	22,500	51,000	51,500	0	0	(61,200)
12. EXPENSE	12	1,200	1,200	1,600	1,600	400	1,600
13. EXPENSE	13	(191,019)	(212,121)	89,317	152,200	112,100	152,200
14. EXPENSE	14	48,000	2,621	50,621	61,306	61,306	61,306
15. EXPENSE	15	5,000	5,000	5,500	5,500	500	5,500
16. EXPENSE	16	31,300	(5,000)	25,400	19,000	19,000	13,210
17. EXPENSE	17	0					
18. EXPENSE	18	1					
19. EXPENSE	19	1,579,400	(155,098)	1,411,502	1,178,503	555,000	1,122,100
20. EXPENSE	20	215,500	(155,000)	200,100	115,600	115,600	115,600
21. EXPENSE	21	112,100	(11,000)	101,100	155,200	55,500	155,500
22. EXPENSE	22	1,100	1,000	1,000	1,000	1,000	2,000
23. EXPENSE	23	1					
24. EXPENSE	24	1					
25. EXPENSE	25	1					
26. EXPENSE	26	1					
27. EXPENSE	27	1					
28. EXPENSE	28	1					
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96. EXPENSE	96	1					
97. EXPENSE	97	1					
98. EXPENSE	98	1					
99. EXPENSE	99	1					
100. EXPENSE	100	1					

TABLE A-3
 BUDGET ESTIMATES & RECOMMENDATIONS — EXPENSES
 in thousands. (Agency and Incorporation Funds)
 FISCAL YEAR
 1980/81

GENERAL DIVISION	ITEM	DESCRIPTION	FISCAL YEAR		FISCAL YEAR		RECOMMENDED BY GENERAL MANAGER AND RECOMMENDED BY BOARD OF DIRECTORS	RECOMMENDED BY GENERAL MANAGER AND RECOMMENDED BY BOARD OF DIRECTORS
			1979/80	ACTUAL EXPENSES	1979/80	ESTIMATED EXPENSES		
1. ACCOM- MODATION	2. DESCRIBE HOW	3.						
4. AIR	5.	6.						
7. AIRLINES	8.	9.	11,000	(11,000)	11,000	11,000	16,500	16,500
10. AIR- TEL	11.	12.	11,000	(6,000)	6,000	7,000	16,500	16,500
11. AIRLINE	12.	13.	181,700	(125,500)	131,210	164,300	172,050	164,300
14. AIRPORT	15.	16.	17,000	11,000	16,510	18,510	18,510	18,510
17. AIRPORT TAXI	18.	19.	90,100	90,100	79,235	79,235	(10,365)	79,235
20. AIRPORT TAXIS	21.	22.	16,300	(19,611)	58,659	85,774	85,774	87,965
23. AIRPORT TAXIS	24.	25.	6,000	2,000	6,000	6,500	6,500	6,500
26. AIRPORT TAXIS	27.	28.	0	0	0	0	0	0
29. AIRPORT TAXIS	30.	31.	2,000	2,000	11,500	11,500	11,500	11,500
32. AIRPORT TAXIS	33.	34.						
35. AIRPORT TAXIS	36.	37.						
38. AIRPORT TAXIS	39.	40.						
41. AIRPORT TAXIS	42.	43.						
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447. AIRPORT TAXIS	448.	449.						
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471. AIRPORT TAXIS	472.	473.						
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527. AIRPORT TAXIS	528.	529.						
529. AIRPORT TAXIS	530.	531.						
531. AIRPORT TAXIS	532.	533.						
534. AIRPORT TAXIS	535.	536.						
537. AIRPORT TAXIS	538.	539.						
539. AIRPORT TAXIS	540.	541.						
541. AIRPORT TAXIS	542.	543.						
544. AIRPORT TAXIS	545.	546.						
547. AIRPORT TAXIS	548.	549.						
549. AIRPORT TAXIS	550.	551.						
551. AIRPORT TAXIS	552.	553.						
554. AIRPORT TAXIS	555.	556.						

BUDGET ESTIMATES & RECOMMENDATIONS - EXPENSES
 for Gas, Oil, Repairs, Maintenance and Transportation Items
 FISCAL YEAR 1960/61

Revised 5/22/60

ITEM OR OPERATION	FISCAL YEAR		FISCAL YEAR		FISCAL YEAR	
	BUDGET	ACTUAL EXPENSE	BUDGET	ADJUSTMENTS	BUDGET	ADJUSTED EXPENSE
1. Maintenance and Repair of Equipment	1,200	1,200	1,200	0	1,200	1,200
2. REFERENCE TRANSFERS	0	0	0	0	0	0
3. a. Budget Division (Grants)	66,000	(1,200)	65,800	96,000	96,000	96,000
4. a. Budget Division (Maintenance)	5,000	0	5,000	1,000	1,000	1,000
5. a. Bus Division (Maintenance)	365,000	(19,000)	346,000	425,000	425,000	425,000
6. a. Bus Division (State Funds)	0	0	0	15,000	15,000	15,000
7. a. Bus Division (State Department)	274,313	31,106	315,421	699,941	115,540	890,411
8. a. District Division	0	0	0	0	0	0
9. a. Total	7,466,913	(1,361,395)	6,205,524	8,394,064	8,394,064	8,394,064
10. b. Bus Division (Maintenance)	0	0	0	0	0	0
11. b. Bus Division (State Funds)	0	0	0	0	0	0
12. b. Total	0	0	0	0	0	0
13. c. Bus Division (Maintenance)	0	0	0	0	0	0
14. c. Bus Division (State Funds)	0	0	0	0	0	0
15. c. Total	0	0	0	0	0	0
16. d. Bus Division (Maintenance)	0	0	0	0	0	0
17. d. Bus Division (State Funds)	0	0	0	0	0	0
18. d. Total	0	0	0	0	0	0
19. e. Bus Division (Maintenance)	0	0	0	0	0	0
20. e. Bus Division (State Funds)	0	0	0	0	0	0
21. e. Total	0	0	0	0	0	0
22. f. Bus Division (Maintenance)	0	0	0	0	0	0
23. f. Bus Division (State Funds)	0	0	0	0	0	0
24. f. Total	0	0	0	0	0	0

TABLE A-9
NET ESTIMATES & RECOMMENDATIONS
-NUES

TABLE I

NET ESTIMATES & RECOMMENDATIONS --

Global State Road, Highway and Transportation District

FISCAL YEAR 1968/69

• Planned loss (\$9,000) to be incurred in Marketing Budget.

TABLE A - 10
 SET ESTIMATES & RECOMMENDATIONS —
 Golden Gate Bridge, Highway and Transportation District
 FISCAL YEAR 1948-49
 (in thousands)

TABLE A - 11
BUDGET ESTIMATES & RECOMMENDATIONS - EXPENSES
in Case Study, Illinois and Terrebonne District
1956-57 YEAR
INITIAL

ACCT. CNTL	FISCAL YEAR		FISCAL YEAR		FISCAL YEAR					
					ACTUAL	BUDGET	ADVISORY	ESTIMATED	ACTUAL	BUDGET
50	50	50	50	50	2,160,936	19,914	2,160,326	2,164,468	213,210	2,165,310
51	51	51	51	51	0	0	0	0	0	0
52	52	52	52	52	0	0	0	0	0	0
53	53	53	53	53	620,728	27,311	644,095	757,415	117,149	760,455
54	54	54	54	54						
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57	57	57	57	57						
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224										

TABLE A - 11
BUDGET ESTIMATES & RECOMMENDATIONS — EXPENSES
for Game Budget, Hollywood and Transportation Budget
FISCAL YEAR
1960/61

DEPARTMENT/ DIVISION	GENERAL CATEGORIES	SUB-CATEGORIES	FISCAL YEAR		FISCAL YEAR		FISCAL YEAR	
			ACTUAL EXPENSE	BUDGET	ADMISSIONS	ESTIMATED EXPENSES	RECOMMENDED BY GENERAL BUDGET COMMITTEE	BUDGET OF GENERAL BUDGET COMMITTEE
1. PERSONNEL	1.1. Employees	1.1.1. Teaching	11,400	11,400	0	19,300	20,300	21,300
		1.1.2. Research	17,000	20,000	12,000	15,000	(17,000)	15,000
		1.1.3. Other	4,300	4,300	0	1,300	(1,300)	1,300
	1.2. Utilities							
	1.3. Telephone		0	0		10,720	10,720	10,720
	1.4. Laundry and Cleaning							
2. EQUIPMENT	2.1. Lease of Air Rentals	2.1.1. Equipment	22,800	22,800	0	59,105	31,105	59,105
	2.2. Furniture							
3. EXPENSE TRANSACTIONS	3.1. Bridge Maintenance							
	3.2. Bus Operation							
	3.3. Ferry Operation							
	3.4. Bridge Capital							
	3.5. Bus Capital							
	3.6. Ferry Capital							
	3.7. Total		0	0	0	0	0	0
	3.8. Total		21,200	21,200	0	59,105	31,105	59,105

TABLE A-12
BUDGET ESTIMATES & RECOMMENDATIONS - CAPITAL IMPROVEMENTS
 Golden Gate Bridge, Highway and Transportation District

BUDGET ESTIMATES & RECOMMENDATIONS - CAPITAL IMPROVEMENTS
 Grand Isle State, Highway and Transportation District
 FISCAL YEAR
 1980/81

BUDGET DIVISION (DEPARTMENT/DEPARTMENT)	ACQUISITION CODE	DESCRIPTION	RECOMMENDED ESTIMATE OF DEPARTMENTAL EXPENDITURE AND REVENUE AMOUNT	CHARGE TO GENERAL FUND OR SPECIAL FUND AMOUNT	BALANCE OF GENERAL FUND OR SPECIAL FUND AMOUNT AVAILABLE FOR APPROPRIATION	PROPOSED FUNDING SOURCE	
						GENERAL FUND OR SPECIAL FUND AMOUNT	GENERAL FUND OR SPECIAL FUND AMOUNT
1.	1.	BUDGET, HIGHWAYS AND TRANSPORTATION (CONTINUED)	4.	4.	4.	4.	4.
2.	2.	By the Appointed Regular Resolution					
3.	3.	* Construction (Additional District force)	250,000	250,000		250,000	
4.	4.	* Materials and Equipment	1,000,000	1,000,000		1,000,000	
5.	5.	Total	A-1 1,250,000	A-2 1,250,000	A-3 1,250,000	A-4 1,250,000	A-5 1,250,000
6.	6.	Fire Registry System					
7.	7.	* Permit (HHR)	80,000	80,000		80,000	
8.	8.	* Construction	220,000	220,000		220,000	
9.	9.	* Communication System Upgrade	22,000	22,000		22,000	
10.	10.	Total	A-4 322,000	322,000	A-5 322,000	A-6 322,000	A-7 322,000
11.	11.	Bridge Security System					
12.	12.	* Construction (District Forces)	5,000	5,000		5,000	
13.	13.	* Consultant and Materials (District)	2,000	2,000		2,000	
14.	14.	Total	A-2 6,000	6,000	A-3 6,000	A-4 6,000	A-5 6,000
15.	15.	Bridge Construction & Replacement					
16.	16.	* Construction	127,000	127,000		127,000	
17.	17.	* Construction Support Services (District)	16,000	16,000		16,000	
18.	18.	Total	A-6 143,000	143,000	A-7 143,000	A-8 143,000	A-9 143,000
19.	19.	Highway Construction					
20.	20.	* Construction	215,000	215,000		215,000	
21.	21.	* Construction Support Services (District)	16,000	16,000		16,000	
22.	22.	Total	A-6 231,000	231,000	A-7 231,000	A-8 231,000	A-9 231,000
23.	23.	Highway Maintenance					
24.	24.	* Construction	29,000	29,000		29,000	
25.	25.	Total	A-6 29,000	29,000	A-7 29,000	A-8 29,000	A-9 29,000

TABLE A - 12 BUDGET ESTIMATES & RECOMMENDATIONS - CAPITAL IMPROVEMENTS

BUDGET ESTIMATES TO RECOMMENDATIONS — CAPITAL IMPROVEMENTS
TABLE A-13
 Graduate Gymnasium and Gymnasium Annex
 Highway and Transportation Budget
FEEDBACK YEAR 1969/70

TABLE A - 13
BUDGET ESTIMATES & RECOMMENDATIONS — CAPITAL IMPROVEMENTS
FISCAL YEAR 1980/81
Golden Gate Bridge, Highway and Transportation District

BUDGET ITEM/DESCRIPTION	ACCESSION CREDITS	DEPARTMENT OR PROGRAM	ITEM NUMBER	DESCRIPTION	PROPOSED EXPENDITURE	
					AMOUNT	PERCENT APPROPRIATED TOWARD EXpenditure
1. 12 coaches with lifts	A	12 coaches with lifts	A-1	12 coaches with lifts	\$ 6,372,291	A-1
2. Rebuild 271 coaches with additional seats	A	Rebuild 271 coaches with additional seats	A-2	271,500	\$ 21,500	"
3. Rebuild 10 articulated coaches with lifts	A	Rebuild 10 articulated coaches with lifts	A-3	150,000	\$ 150,000	"
4. Industrial construction protection	B	Industrial construction protection	A-4	26,000	\$ 26,000	"
5. Shop floor dynometer/falling	B	Shop floor dynometer/falling	B-1	15,000	\$ 15,000	A-6
6. Building for drive	B	Building for drive	B-2	10,000	\$ 2,000	10,000
7. Engineer, maintenance	B	Engineer, maintenance	B-3	3,000	\$ 3,000	"
8. Office, eastbound	B	Office, eastbound	B-4	3,000	\$ 3,000	"
9. Several asphalt parking areas	B	Several asphalt parking areas	B-5	16,000	\$ 16,000	A-5
10. Concrete pads, Santa Rosa	B	Concrete pads, Santa Rosa	B-6	8,000	\$ 8,000	\$ 8,000
11. Bridge facilities, San Francisco	B	Bridge facilities, San Francisco	B-7	100,000	\$ 100,000	B-7
12. Storage facilities, Burlingame	B	Storage facilities, Burlingame	B-8	155,000	\$ 155,000	B-8
13. Auto requirements (12)	B	Auto requirements (12)	B-9	15,000	\$ 15,000	B-9
14. Industrial light fixture, San Bruno	B	Industrial light fixture, San Bruno	C-1	2,400	\$ 0	0
15. Industrial west cypress, San Bruno	B	Industrial west cypress, San Bruno	C-2	10,000	\$ 10,000	B-11
16. Porter and companion	B	Porter and companion	C-3	11,000	\$ 0	11,000
17. Industrial washroom	B	Industrial washroom	C-4	2,500	\$ 0	0
18. Water fountains, Burlingame	B	Water fountains, Burlingame	C-5	1,300	\$ 300	B-12
19. Street Cleaners	B	Street Cleaners	C-6	16,000	\$ 0	0
20. Porta storage, Burlingame	B	Porta storage, Burlingame	C-7	150,000	\$ 0	0
21. Storage titles, articulated buses	B	Storage titles, articulated buses	C-8	40,000	\$ 0	0
22. Industrial west cypress, San Bruno	B	Industrial west cypress, San Bruno	C-9	1,600,000	\$ 1,600,000	B
23. Industrial west cypress, San Bruno	B	Industrial west cypress, San Bruno	C-10	1,600,000	\$ 1,600,000	B
24. Industrial west cypress, San Bruno	B	Industrial west cypress, San Bruno	C-11	1,600,000	\$ 1,600,000	B
25. Industrial west cypress, San Bruno	B	Industrial west cypress, San Bruno	C-12	1,600,000	\$ 1,600,000	B

TABLE A - 14
BUDGET ESTIMATES & RECOMMENDATIONS -- CAPITAL IMPROVEMENTS
Golden Gate Bridge, Highway and Transportation District
FISCAL YEAR 1960/61

PROJECT NUMBER	ACROSS CREEK	BEYOND CREEK	COST IN \$000	RECOMMENDED IMPLEMENTATION PERIOD	RECOMMENDED GENERAL SOURCE AMOUNT	PROPOSED EXPENDITURE	
						GENERAL WATER POWER AGENCY	GENERAL WATER POWER AGENCY APPROVED AMOUNT
1	8	2	269,000	A-1	269,000	8-1	269,000
21	8	2	1,000	A-2	1,000	A-2	1,000
22	8	2	13,000	A-3	13,000	A-3	13,000
24	8	2	5,000	A-4	5,000	A-4	5,000
26	8	2	4,000	A-5	4,000	A-5	4,000
28	8	2	25,000	A-6	25,000	A-6	25,000
29	8	2	2,125,000	A-7	2,125,000	A-7	2,125,000
30	8	2	20,000	B-1	20,000	B-1	20,000
31	8	2	13,000	B-2	13,000	B-2	13,000
32	8	2	95,000	B-3	95,000	B-3	95,000
33	8	2	29,000	B-4	29,000	B-4	29,000
34	8	2	15,000	B-5	15,000	B-5	15,000
35	8	2	11,000	B-6	11,000	B-6	11,000
36	8	2	20,000	B-7	20,000	B-7	20,000
37	8	2	6,000	B-8	6,000	B-8	6,000
38	8	2	23,110	B-9	23,110	B-9	23,110
39	8	2	2,600	B-10	2,600	B-10	2,600
40	8	2	5,000	B-11	5,000	B-11	5,000
41	8	2	4,000	B-12	4,000	B-12	4,000
42	8	2	15,000	B-13	15,000	B-13	15,000
43	8	2	5,000	C-1	5,000	C-1	5,000
44	8	2	6,000	C-2	6,000	C-2	6,000
45	8	2	1,911,900		1,911,900		1,911,900
46	8	2	2,000,200		2,000,200		2,000,200
47	8	2	2,000,200		2,000,200		2,000,200

TABLE A - 14
BUDGET ESTIMATES & RECOMMENDATIONS — CAPITAL IMPROVEMENTS
 (Golden Gate Bridge, Highway and Transportation District
 FISCAL YEAR 1980/81)

FISCAL TRANSIT FUNDING		RECOMMENDED		ESTIMATED	
ACCOUNT CODE	DESCRIPTION	DEPARTMENT	GENERAL FUND	GENERAL FUND	GENERAL FUND
42		GENERAL	4	4	4
42-1	APPROVED CAPITAL	GENERAL	4	4	4
42-10	CA 03 0036 (First 500k/Phase 1)	GENERAL	200,400	200,400	200,400
42-101	CA 01 0109 (Side panels and doors)	GENERAL	103,100	103,100	103,100
42-102	CA 05 0012 (Air Filtration/Blower)	GENERAL	400,000	400,000	400,000
42-103		GENERAL			
42-104		GENERAL			
42-105		GENERAL			
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TABLE A - 15

**GOLDEN GATE BRIDGE, HIGHWAY AND TRANSPORTATION DISTRICT
DISTRICT REVENUE EXPENDITURES 1971-1978
(BILLIONS OF DOLLARS)**

Fiscal Year	Beginning District Total, Restricted	Reserves Available	Bridge Operations	Bridge Major Repairs/Capital	Bridge Major Repairs/Capital	District Subsidy Bus/Ferry	District Share Transit Capital Grants & Capital	Ending District Total, Restricted	Reserves Available
1971-1972	22.8	7.5	15.3	5.0	(1.1)	(2.3)	(3.8)	13.1	
1972-1973	20.6	7.5	13.1	4.9	(2.0)	(1.8)	(1.8)	12.4	
1973-1974	19.9	8.2	11.7	6.2	(2.4)	(2.2)	(3.7)	9.6	
1974-1975	17.8	6.1	11.7	8.1	(2.9)	(2.8)	(5.1)	9.0	
1975-1976	15.1	6.5	8.6	7.4	(2.9)	(3.2)	(2.0)	7.9	
1976-1977	14.4	7.7	6.7	7.4	(.3)	(7.4)	(1.6)	4.3	
1977-1978	12.9	9.8	3.1	8.7	(.2)	(3.8)	(0.1)	1.7	
1978-1979	12.6	10.5	2.1	10.1	(.6)	(7.1)	(.7)	3.8	
1979-1980	14.9	17.5	(2.6)*	11.9	(.7)	(8.3)	(.4)	0	

Source: District annual reports Fiscal Years 1972-1979
* Transferred to Restricted Reserves

Reserves as of June 30, 1980
(billions of dollars)

Bridge Deck Replacement	\$4.8	Special \$ 8 M Transit Reserve
Maintenance Channel Dredging	0.4	Reserve for Transit Operations
Depreciation Reserves - Buses & Ferries	3.1	1.6
Insurance Losses	1.2	Reserve for Working Capital
Emergency Reserve	5.0	1.0

11m

\$0.4
\$17.5²
Available for
Transit

APPENDIX B

ESTIMATION OF AUTOMOBILE EMISSIONS AND FUEL CONSUMPTION IMPACTS OF PROPOSED TOLL AND FARE INCREASES

Estimation of Automobile Emissions and Fuel Consumption Impacts of
Proposed Toll and Fare Increases

The process for estimating current auto emissions and fuel consumption and the extent to which they would be changed by various toll and fare increases consisted of the following steps:

- 1) Estimating the effects of the toll and fare increases on annual auto traffic volumes across the Golden Gate Bridge;
- 2) Estimating the average mileage in various speed ranges for automobiles crossing the Bridge;
- 3) Estimating the emissions and fuel consumption of automobiles of different makes, models, and years of manufacture under various operating conditions;
- 4) Estimating the mix of automobile makes, models, and years and the operating conditions in the Bay Area;
- 5) Calculating the average emissions and fuel consumption for each auto crossing the Bridge using the above estimates, and
- 6) Using the latter factors and the traffic estimates to calculate current emissions and fuel consumption and the changes which would result from increased tolls or fares.

The traffic estimates, step 1) are given in the main body of this report. The second step will be described in detail later in this appendix. Steps 3), 4), and 5) are incorporated in the EMFAC computer model which Russell Weeks of Caltrans' Environmental Planning Branch used along with Golden Gate Bridge, Highway and Transportation Districts mileage-speed data to produce the factors shown in Table B - 1. These factors were applied to the traffic estimates to generate the emissions and fuel consumption bases and impacts in Tables 4-2, 5-2, and 5-3 of this report and shown along with projected future impacts in Tables B, B'2a, and B 2b in this Appendix.

Estimates of Average Mileage at Various Speeds for Autos Crossing the Bridge

Similar estimates were developed for the Environmental Impact Report on Toll and Fare Increases prepared in 1978. But since it was expected that traffic patterns would have changed as a result of increased gasoline prices since 1978, and since more recent data on trip origins and destinations was available from Caltrans, new estimates were made. The new estimate of trip length was shorter and the estimates of speeds were somewhat higher. This is consistent with the reductions in auto travel and in peak period congestion that has occurred since the previous estimates

were made.

The Caltrans origin and destination data were based on a May 1979* survey of autos on Highway 101 between South Novato Boulevard and Sir Francis Drake Boulevard during the southbound peak period and thus provided information on travel patterns of transbay traffic originating from Sir Francis Drake Boulevard north. Bridge statistics were combined with this data to estimate the amount of transbay traffic originating south of Sir Francis Drake Boulevard. The distribution of origins of this traffic was assumed to be the same as in the 1978 analysis. The Caltrans data covered the period from 6:30-9:00 a.m. The whole period was used as the basis for estimating peak period patterns in the morning and in the evening. Weekend and off-peak weekday travel was based on the pattern of traffic from 8:30 to 9:00, this being the most like off-peak of any interval covered by the survey. Data were given for single passenger autos destined for downtown San Francisco as well as for all autos destined for any part of San Francisco and points south. The former was used to represent the travel patterns of people who would cease driving if tolls were increased for single passenger autos in the peak periods. The latter were used to represent the existing travel patterns and patterns of those who would cease driving if there were a general toll increase or who would begin to drive if there were an increase in transbay bus fares. Using existing travel patterns to represent the patterns of people whose automobile use would be changed by toll or fare increases implicitly assumes that the probability of travel behavior being changed is the same for travelers from all origins.

This does not seem to be an unreasonable assumption. Transit may be more attractive relative to auto use in some areas and thus more likely to attract patrons. But, by the same token, transit in that area may have already attracted a higher proportion of those travelers able to use transit, thus leaving a smaller pool of people able to switch to transit.

Speeds in San Francisco and off the freeway in Marin were assumed to range between 20 and 30 miles per hour. Average speeds for each section of the freeway for each half hour interval during the morning peak and for the evening peak** period were obtained from Caltrans report entitled, Route 101 Existing Traffic Operations 1979, Sir Francis Drake Boulevard to Route 37 in Marin County, August 1980. On weekends and

*The survey data were adjusted to correct for the abnormal travel patterns caused by the gasoline shortage in that month.

**All autos traveling south during the morning peak were assumed to travel north during the evening peak, but no estimates were made as to their distribution in time over the evening peak. Therefore, average speeds for the entire evening peak were used.

off-peak on weekdays, freeway speeds were assumed to range between 50 and 60 miles per hour.

From these travel patterns an average pattern of vehicle miles traveled in each speed range was calculated for two cases: the peak period single passenger auto trip and all auto trips at all times of the day and week. These patterns, shown in Table B-3, were then used in the EMFAC model.

Estimates of the Impact of Increases in Bus Fares

The estimates of changes in bus patronage resulting from increases in bus fares are given in the main body of the report. It was assumed that all bus trips would be replaced by auto trips at the current transbay weekday occupancy rate, 1.3 persons per car, since most bus travel is on weekdays. This may result in an overestimation of the effects of a local fare increase, but this alternative has very small impacts so that the absolute magnitude of the error cannot be large. Transbay bus trips average 22.10 miles and local trips on transbay buses average 5.33 miles. Since bus trips are generally somewhat more circuitous than auto trips between the same origin and destination, the auto trips were assumed to be 21.6 and 5 miles long. Transbay auto trips were assumed to have the same distribution of speeds as current traffic. The peak period speed characteristics were used for the local trips since they included a higher proportion of low speeds and, thus, were more characteristic of local travel.

EMFAC

The model was developed by the California Air Resources Board and is based on the EPAs MOBILE model. EMFAC uses California emissions and fuel consumption factors which differ from those in other states. EMFAC has been modified and updated several times.

	First Half 1981	FY 81/82	FY 82/83	FY 83/84	FY 84/85
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Single Occupant Transbay
Auto Trips Peak Period

Emissions (Tons/1000 Auto Trips)					
Carbon Monoxide	.47	.44	.39	.35	.31
Hydrocarbons	.039	.037	.032	.028	.025
Nitrogen Oxides	.055	.055	.051	.047	.044
Fuel Consumption (Gallons/Auto Trip)	1.0812	1.0608	1.0200	.9588	.9180

All Transbay Auto Trips At All Times

Emissions (Tons/1000 Auto Trips)					
Carbon Monoxide	.48	.45	.39	.35	.31
Hydrocarbons	.041	.039	.033	.027	.023
Nitrogen Oxides	.063	.061	.056	.052	.046
Fuel Consumption (Gallons/Auto Trip)	1.1448	1.1016	1.0584	1.0152	.9504

Table B-1 (Continued)

Local Auto Trips	First Half 81/82	FY 82/83	FY 83/84	FY 84/85
Emissions (Tons/1000 Auto Trips)				
Carbon Monoxide	.12	.11	.10	.9
Hydrocarbons	.010	.009	.009	.008
Nitrogen Oxides	.015	.015	.014	.012
Fuel Consumption (Gallons/Auto Trip)				
	.2650	.2600	.2500	.2350
				.2250

Source: GGBITD Planning & Policy Analysis Statistics

nlm

Table B-2

PROJECTED IMPACTS OF ALTERNATIVE TOL POLICIES

VEHICLE MILES TRAVELED (Millions of Miles Per Year)	EMISSIONS (Tons Per Year)						FUEL CONSUMPTION (Thousands of Gallons Per Year)									
	1.1* 81	FY 81/82	FY 82/83	FY 83/84	FY 84/85	Pollutant	1.1* 81	FY 81/82	FY 82/83	FY 83/84	FY 84/85	1.1* 81	FY 81/82	FY 82/83	FY 83/84	FY 84/85
Base Traffic 387.1	782.0	789.8	797.7	805.7		CO	860.3	16792	14261	12926	11563	20517	39882	38701	37493	35450
						HC	735	1412	1207	997	853					
						NOx	1129	2298	2048	1920	1716					
Alternatives	Change from Base															
A. \$1.50/0.75/ free	-1.6	-3.3	-3.4	-3.4	-3.4	CO	-38	-71	-64	-58	-52	-87	-172	-168	-160	-155
						HC	-3	-6	-5	-5	-4					
						NOx	-4	-9	-3	-7	-7					
B. \$2.00/1.00/ free	-3.5	-7.0	-7.1	-7.2	-7.3	CO	-80	-152	-136	-122	-111	-134	-366	-356	-339	-329
						HC	-7	-13	-11	-8	-9					
						NOx	-9	-19	-18	-16	-16					
C. \$2.00/free/ free	-3.0	-6.1	-6.1	-6.2	-6.3	CO	-69	-131	-117	-105	-96	-153	-315	-307	-292	-283
						HC	-6	-11	-10	-8	-6					
						NOx	-8	-16	-15	-14	-13					

Table H-2 (continued)

0.5% (0.1% S0/ free	-3.2	-6.5	-6.6	-6.7	-6.8	C0	-74	-141	-127	-113	-103	-171	-340	-331	-315	-306
HC						HC	-6	-12	-10	-9	-8					
NOx						NOx	-9	-18	-17	-15	-14					

* H = January through June 1981

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Sources: Vehicle miles traveled estimated from Geffrid Bridge Traffic Statistics and Route 101 Existing Traffic Operations 1979, Sir Francis Drake Boulevard to Route 37 in Marin County, Caltrans, August 1980.

Emissions and fuel consumption from Caltrans "ENFAC" computer model.

Table B-2a

PROJECTED IMPACTS OF ALTERNATIVE TOLL POLICIES

Alternative	CHANGE IN VEHICLE MILES TRAVELED (Million's of Miles Per Year)						CHANGE IN EMISSIONS (Tons Per Year)						CHANGE IN FUEL CONSUMPTION (Thousands of Gallons Per Year)					
	1 H* 81	FY 81/82	FY 82/83	FY 83/84	FY 84/85	Pollutant	1 H* 81	FY 81/82	FY 82/83	FY 83/84	FY 84/85	1 H* 81	FY 81/82	FY 82/83	FY 83/84	FY 84/85		
E, \$1.25 all day except carpools free	-1.4	-2.8	-2.9	-2.9	-2.9	CO	-31	-59	-51	-47	-42	-74	-144	-140	-135	-128		
F, \$1.50 all day except carpools free 6-9AM and 4-6PM	-3.1	-6.3	-6.3	-6.4	-6.5	CO	-64	-130	-114	-104	-93	-164	-319	-310	-300	-284		
G, \$1.25 all day except \$1.50 for single occupant auto's 7-9AM carpools free all day	-2.0	-4.1	-4.1	-4.2	-4.2	CO	-45	-85	-74	-67	-60	-107	-208	-201	-195	-184		
H, \$1.50 all day for single occupant auto's \$1.25 all day for two passenger auto's, carpools free all day	-2.3	-4.6	-4.7	-4.7	-4.8	CO	-51	-96	-84	-76	-68	-121	-236	-229	-222	-210		

Table B-2a (continued)

Alternative	CHANGE IN VEHICLE MILES TRAVELED (Millions of Miles Per Year)				Pollutant	CHANGE IN EMISSIONS (Tons Per Year)				CHANGE IN FUEL CONSUMPTION (Thousands of Gallons Per Year)			
	1 H*	FY 81/82	FY 82/83	FY 83/84		1 H*	FY 81/82	FY 82/83	FY 83/84	1 H*	FY 81/82	FY 82/83	FY 83/84
1. \$1.25 all day -2.3 except \$1.50 for single occupant autos, \$1.00 for two occupant autos, and carpools free, 7-9 AM	-4.7	-4.8	-4.8	-4.9	CO	-52	-98	-86	-78	-70	-124	-240	-233
					HC	-4	-9	-7	-7	-6	-5		
					NOx	-7	-13	-12	-12	-12	-10		

n/a

Table B-2b

PROJECTED IMPACTS OF BUS FARE INCREASES

Alternative	CHANGE IN VEHICLE MILES TRAVELED (Millions of Miles Per Year)				CHANGE IN EMISSIONS (Tons per Year)				CHANGE IN FUEL CONSUMPTION (Thousands of Gallons Per Year)							
	1 H*	FY 81/82	FY 82/83	FY 83/84	FY 84/85	Pollutant	1 H*	FY 81/82	FY 82/83	FY 83/84	FY 84/85	1 H*	FY 81/82	FY 82/83	FY 83/84	FY 84/85
60% farebox return on intercounty buses	1.8	3.9	4.3	4.9	5.8	CO	40.1	82.1	77.0	78.9	83.4	96	201	209	229	256
60% farebox return from local Marin patrons on intercounty buses	.4	.8	.8	.9	1.0	CO	8.2	16.8	16.2	15.6	18.6	19	41	42	44	46

Source: same as Table B-2

Table B-3

		VEHICLE MILES PER TRIP PER AUTO			TOTAL
		30-40 MPH	40-50 MPH	50-60 MPH	
Single Occupant Transbay	20-30 MPH				
Auto Trips Peak Period	7.6	3.4	2.7	6.7	20.4
All Transbay Auto Trips					
At All Times	7.7	.7	.6	12.6	21.6
Local Auto Trips					
	1.9	.8	.7	1.6	5.0

